

# ENGINEERING MANAGEMENT SUPPORT INC.

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November 10, 2015

VIA: Electronic Mail

U.S. Environmental Protection Agency  
Region VII SUPR/MOKS  
11201 Renner Boulevard  
Lenexa, KS 66219

**ATTENTION:** Mr. Bradley Vann

**SUBJECT: Monthly Status Report – October 2015**  
**West Lake Landfill Operable Unit 1, Bridgeton, Missouri**

Dear Mr. Vann,

On behalf of Cotter Corporation (N.S.L.), Bridgeton Landfill, LLC., Rock Road Industries, Inc., and the United States Department of Energy (the “Respondents”), Engineering Management Support Inc. (EMSI) submits the attached status report for the month of October 2015 as required by paragraph 56 of the West Lake Landfill Administrative Order on Consent, Docket No. VII-93-F-005. If you have any questions or desire additional information related to this status report or any other aspect of the project, please do not hesitate to contact me.

Sincerely,  
ENGINEERING MANAGEMENT SUPPORT, Inc.



Paul V. Rosasco, P.E.

Distribution:

Lynn Juett – EPA Region 7  
Tiffany Drake - Missouri Dept of Natural Resources  
Victoria Warren – Republic Services, Inc.  
Ward Herst - Herst & Associates, Inc.  
Jessie Merrigan – Lathrop & Gage  
Nicholas Johnson – Lathrop & Gage  
Bill Beck – Lathrop & Gage  
Dale Guariglia – Bryan Cave HRO  
John McGahren – Morgan Lewis  
Steven Miller - U. S. Department of Energy  
Philip Dupre – U.S. Department of Justice  
Dan Feezor – Feezor Engineering  
Mike Bollenbacher – Auxier & Associates

**Monthly Status Report – October 2015**  
**West Lake Landfill Operable Unit 1**  
**Bridgeton, Missouri**

This status report has been prepared by Engineering Management Support Inc. (EMSI) on behalf of Cotter Corporation (N.S.L.), Bridgeton Landfill, LLC (formerly known as Laidlaw Waste Systems [Bridgeton] Inc.), Rock Road Industries, Inc., and the United States Department of Energy (the “Respondents”) for Operable Unit - 1 (OU-1) at the West Lake Landfill as required by paragraph 56 of the West Lake Landfill Administrative Order on Consent, Docket No. VII-93-F-005.

## **1. Work Performed During October 2015**

### Project Planning

A final work plan for the Phase 1D investigation along with responses to EPA’s April 24, 2015 comments were submitted to EPA on May 1, 2015. EPA approved this revised work plan, with comments, on May 5, 2015. Responses to the comments included in EPA’s letter approving the May 1, 2015 version of the Work Plan Addendum for Phase 1D along with revised responses to EPA’s April 24, 2015 comments were submitted on May 23, 2015.

In an April 20, 2015 letter to the OU-1 Respondents, EPA requested the Respondents to conduct additional soil borings and sampling in Areas 1 and 2. A Work Plan for Additional Characterization of Areas 1 and 2 was submitted to EPA on July 6, 2015. EPA comments on the Work Plan were received via electronic mail on July 31, 2015. MDNR comments on the Work Plan were also received via electronic mail on this same date. Responses to these comments were prepared and submitted to EPA and MDNR on August 4 and August 14, 2015. EPA provided conditional approval of the Work Plan on August 21, 2015. A revised Work Plan incorporating the responses to comments and addressing additional issues identified in EPA’s August 21, 2015 letter was prepared and submitted to EPA on August 28, 2015. On September 1, 2015, MDNR provided comments on the August 14, 2015 responses to comments. On September 3, 2015, EPA partially approved the revised Work Plan with additional comments/conditions and authorized the Respondents to begin the work. On September 4, 2015, Bradley Vann of EPA contacted Paul Rosasco of EMSI by telephone with instructions to stop all work pending review of expert reports filed by the Missouri Attorney General. On September 17, 2015, EPA approved commencement of the work. Responses to EPA’s additional comments/conditions and a final Work Plan were submitted to EPA on September 22, 2015. Final responses to MDNR’s comments on the August 14, 2015 responses to comments were submitted to EPA and MDNR on October 3, 2015. The Quality Assurance Project Plan (QAPP) for the additional testing to support the fate and transport evaluations was submitted to EPA on October 27, 2015.

A revised Work Plan for Partial Excavation Alternative that includes all three partial excavation options identified by EPA and also includes the results of the additional characterization of Areas 1 and 2 was prepared and submitted to EPA on July 23, 2015.

A revised Work Plan for Alternative Area Excavation Depths and Volumes that includes the results of the additional characterization of Areas 1 and 2 was prepared and submitted to EPA on July 23, 2015.

A revised work plan for performance of fate and transport evaluations was submitted to EPA and MDNR on September 4, 2014. EPA comments on the revised work plan for performance of fate and transport evaluations were received on December 19, 2014. A conference call was held with EPA on February 10, 2015 to discuss EPA comments on the revised work plan for fate and transport evaluations. A revised work plan was submitted to EPA and MDNR on August 5, 2015.

A draft Remedial Design Work Plan was submitted to EPA in November 2008. In accordance with direction from EPA, all work on design of the ROD-selected remedy has been put on hold.

#### Fieldwork and Sample Collection/Analysis

Air quality monitoring activities were performed pursuant to the EPA-approved Air Monitoring, Sampling and QA/QC Plan.

Site preparation work to support the Additional Characterization of Areas 1 and 2 began on October 6, 2015. Drilling and sampling activities for this work began on October 26, 2015.

#### Report Preparation

EMSI received EPA comments on the Isolation Barrier Alternatives Analysis (IBAA) via electronic mail on March 10, 2015. Preparation of responses to these comments was performed during this period. Via an electronic mail dated March 31, 2015, EPA subsequently extended the period for preparation of responses to comments from the initially required period of 30 days to a period of 90 days, making the responses to comments due on June 9, 2015. EPA also indicated that only certain comments, specifically those related to radon flux, needed to be responded to by this date.

Responses to those comments related to radon flux calculations were submitted to EPA on June 9, 2015. Via a July 23, 2013 electronic mail, EPA indicated that responses to the remaining comments should be submitted by August 22, 2015. A request for an extension for an additional 45 days was made to and subsequently granted by EPA such that the responses to comments were due on October 6, 2015. Responses to the remaining comments were submitted to EPA on October 6, 2015.

EPA approval of the apatite technology evaluation work plan was received on March 20, 2015 and work related to the evaluation of apatite treatment technologies was performed during this period.

The monthly progress report for September 2015 was prepared and submitted to EPA and MDNR on October 12, 2015.

#### Project Management

None.

#### Meetings

None.

#### Correspondence

In an October 9, 2015 letter and attached Statement of Work, EPA requested the OU-1 Respondents to perform additional evaluations and prepare additional reports related to a Remedial Investigation Addendum, a Final Feasibility Study, and changes to the air monitoring program. By letter dated October 20, 2015, the OU-1 Respondents agreed to perform the work requested by EPA, subject to modification or adjustment, in consultation with EPA and subject to the comments set forth in that letter.

### **2. Analytical Data Collected During This Reporting Period**

The following analytical reports were received during this period:

#### Air Monitoring Samples

- Eurofins AirToxics Laboratory reports 1508373, 1509045, 1509264 and 1510016; and
- Eberline Analytical Laboratory report 1509112.

Electronic files of these reports are included with this monthly report.

### **3. Work Scheduled to be Performed during November and December 2015**

The following activities are expected to be performed during the upcoming two months:

- Continuation of air monitoring activities in accordance with the EPA-approved Air Monitoring, Sampling and QA/QC Plan;

- Continuation of site preparation work and drilling and sampling activities associated with the Additional Characterization of Areas 1 and 2;
- Review and validation of the laboratory data from the air monitoring program;
- Completion of a Comprehensive Phase 1 Investigations Report;
- Subject to EPA approval of the revised fate and transport work plan, begin performance of fate and transport evaluations;
- Evaluation of apatite treatment technologies; and
- Continued work on verifying and assembling historic site data into a form suitable for loading into EQuIS.

#### **4. Problems Encountered**

As a result of EPA's decision on September 4, 2015 to temporarily halt implementation of the field work related to the Additional Characterization of Areas 1 and 2<sup>1</sup> and the associated impact on the work schedule, the drilling company (Frontz Drilling) and drilling technique (rotosonic) that had been used for the Phase 1 work was no longer available once work was subsequently authorized to commence. The alternate drilling company (Roberts Drilling) that had previously been used in Phase 1 was also not available. In order to meet EPA's desire to initiate the additional investigation as soon as possible, alternate drilling companies were contacted.

After researching drilling company capabilities and availability, PSA Environmental was selected to perform the drilling work. Drilling activities began on October 26, 2015. Unfortunately, it quickly became apparent that the PSA geoprobe rig was unable to penetrate the full thickness of the waste materials in the initial few holes that were attempted, and was also unsuccessful in obtaining sufficient core recovery. PSA drilling work was accordingly terminated on October 29, 2015. Meanwhile, Roberts Drilling indicated that they would now be available the week of November 2, 2015. Roberts Drilling provided a larger geoprobe rig that was also capable of using hollow stem auger drilling methods to obtain continuous soil core samples. Although the Roberts Drilling equipment was capable of penetrating through the waste materials in Areas 1 and 2, the amount of core sample material obtained using these methods was determined to be insufficient for the objectives of the additional characterization of Areas 1 and 2. Therefore, Roberts Drilling work was terminated on November 3, 2015.

Frontz Drilling is scheduled to begin drilling work on November 9, 2015.

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<sup>1</sup> EPA authorized Respondents to commence the work by email from Bradley Vann dated September 17, 2015.

## Laboratory Analytical Reports

9/3/2015  
Ms. Cecilia Greene  
Auxier & Associates, Inc.  
9821 Cogdill Road, Suite 1

Knoxville TN 37932

Project Name: Westlake Landfill  
Project #:  
Workorder #: 1508373

Dear Ms. Cecilia Greene

The following report includes the data for the above referenced project for sample(s) received on 8/21/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. RAD130/SKC are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**A Eurofins Lancaster Laboratories Company**

**WORK ORDER #:** 1508373

## Work Order Summary

<b>CLIENT:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932	<b>BILL TO:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932
<b>PHONE:</b>	865-675-3669	<b>P.O. #</b>	
<b>FAX:</b>	865-675-3677	<b>PROJECT #</b>	Westlake Landfill
<b>DATE RECEIVED:</b>	08/21/2015	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	09/03/2015		

<b><u>FRACTION #</u></b>	<b><u>NAME</u></b>	<b><u>TEST</u></b>
01A	ENGWESA001	Passive S.E. RAD130/SKC
02A	ENGWESA005	Passive S.E. RAD130/SKC
03A	ENGWESA007	Passive S.E. RAD130/SKC
04A	ENGWESA008	Passive S.E. RAD130/SKC
05A	ENGWESA011	Passive S.E. RAD130/SKC
06A	Duplicate	Passive S.E. RAD130/SKC
07A	TRIP BLANK	Passive S.E. RAD130/SKC
08A	Lab Blank	Passive S.E. RAD130/SKC
09A	LCS	Passive S.E. RAD130/SKC
09AA	LCSD	Passive S.E. RAD130/SKC

CERTIFIED BY:



DATE: 09/03/15

Technical Director

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, Inc.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563  
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE**  
**Passive SE GC/MS**  
**Auxier & Associates, Inc.**  
**Workorder# 1508373**

Seven Radiello 130 (Solvent) samples were received on August 21, 2015. The laboratory extracted the charcoal sorbent bed of the passive sampler using carbon disulfide. An aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

#### **Receiving Notes**

There were no receiving discrepancies.

#### **Analytical Notes**

The uptake rates were corrected based on average field temperatures if provided. In the absence of field temperatures, the uptake rates determined at 25 deg C were used.

To calculate ug/m<sup>3</sup> concentrations in the Lab Blank and Trip Blank, a sampling duration of 20278 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page.

#### **Definition of Data Qualifying Flags**

Nine qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA001**

**Lab ID#: 1508373-01A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.24	0.15
Hexane	0.10	0.075	0.63	0.47
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.28	0.18
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.43	0.26
Heptane	0.10	0.085	0.29	0.24
Toluene	0.10	0.067	0.96	0.64
Tetrachloroethene	0.10	0.084	0.56	0.47
Ethyl Benzene	0.10	0.072	0.14	0.099
m,p-Xylene	0.10	0.070	0.42	0.30
o-Xylene	0.10	0.076	0.12	0.095

**Client Sample ID: ENGWESA005**

**Lab ID#: 1508373-02A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Hexane	0.10	0.075	0.60	0.45
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.29	0.18
Carbon Tetrachloride	0.10	0.074	0.45	0.33
Benzene	0.40	0.25	0.53	0.33
Heptane	0.10	0.085	0.26	0.22
Toluene	0.10	0.067	1.2	0.78
Tetrachloroethene	0.10	0.084	0.11	0.094
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.53	0.37
o-Xylene	0.10	0.076	0.16	0.12

**Client Sample ID: ENGWESA007**

**Lab ID#: 1508373-03A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.23	0.15
Hexane	0.10	0.075	0.73	0.55



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA007****Lab ID#: 1508373-03A**

Ethyl Acetate	0.40	0.25	0.54	0.35
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.26	0.16
Cyclohexane	0.10	0.092	0.12	0.11
Carbon Tetrachloride	0.10	0.074	0.41	0.30
Benzene	0.40	0.25	0.43	0.27
Heptane	0.10	0.085	0.26	0.22
Toluene	0.10	0.067	1.3	0.87
Tetrachloroethene	0.10	0.084	0.12	0.097
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.58	0.41
o-Xylene	0.10	0.076	0.17	0.13

**Client Sample ID: ENGWESA008****Lab ID#: 1508373-04A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.21	0.13
Hexane	0.10	0.075	0.57	0.43
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.26	0.16
Carbon Tetrachloride	0.10	0.074	0.38	0.28
Benzene	0.40	0.25	0.41	0.26
Heptane	0.10	0.085	0.23	0.20
Toluene	0.10	0.067	0.96	0.64
Ethyl Benzene	0.10	0.073	0.15	0.11
m,p-Xylene	0.10	0.071	0.52	0.37
o-Xylene	0.10	0.076	0.16	0.12

**Client Sample ID: ENGWESA011****Lab ID#: 1508373-05A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.24	0.15
Hexane	0.10	0.075	1.7	1.2
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.23	0.14



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA011****Lab ID#: 1508373-05A**

Cyclohexane	0.10	0.092	0.13	0.12
Carbon Tetrachloride	0.10	0.074	0.37	0.27
Benzene	0.40	0.25	0.70	0.43
Heptane	0.10	0.085	0.48	0.41
Toluene	0.10	0.067	1.2	0.77
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.53	0.37
o-Xylene	0.10	0.076	0.15	0.11

**Client Sample ID: Duplicate****Lab ID#: 1508373-06A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Hexane	0.10	0.075	0.56	0.42
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.28	0.18
Carbon Tetrachloride	0.10	0.074	0.31	0.23
Benzene	0.40	0.25	0.42	0.26
Heptane	0.10	0.085	0.28	0.24
Toluene	0.10	0.067	0.95	0.64
Ethyl Benzene	0.10	0.073	0.15	0.11
m,p-Xylene	0.10	0.071	0.49	0.34
o-Xylene	0.10	0.076	0.14	0.11

**Client Sample ID: TRIP BLANK****Lab ID#: 1508373-07A**

No Detections Were Found.



Air Toxics

Client Sample ID: ENGWESA001

Lab ID#: 1508373-01A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082811sim</b>	<b>Date of Collection:</b>	<b>8/19/15 11:15:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>8/28/15 11:36 AM</b>	
		<b>Date of Extraction:</b>	<b>8/28/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.24	0.15
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.63	0.47
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.28	0.18
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.091	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.43	0.26
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.29	0.24
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	0.96	0.64
Tetrachloroethene	0.10	0.084	0.56	0.47
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	0.14	0.099
m,p-Xylene	0.10	0.070	0.42	0.30
o-Xylene	0.10	0.076	0.12	0.095
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20278 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	106	70-130



Air Toxics

Client Sample ID: ENGWESA005

Lab ID#: 1508373-02A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082812sim</b>	<b>Date of Collection:</b>	<b>8/19/15 10:00:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>8/28/15 11:59 AM</b>	
		<b>Date of Extraction:</b>	<b>8/28/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.60	0.45
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.29	0.18
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.45	0.33
Benzene	0.40	0.25	0.53	0.33
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.26	0.22
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.2	0.78
Tetrachloroethene	0.10	0.084	0.11	0.094
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.53	0.37
o-Xylene	0.10	0.076	0.16	0.12
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20190 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: ENGWESA007

Lab ID#: 1508373-03A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082813sim</b>	<b>Date of Collection:</b>	<b>8/19/15 7:45:00 PM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>8/28/15 12:23 PM</b>	
		<b>Date of Extraction:</b>	<b>8/28/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.23	0.15
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.73	0.55
Ethyl Acetate	0.40	0.25	0.54	0.35
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.26	0.16
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	0.12	0.11
Carbon Tetrachloride	0.10	0.074	0.41	0.30
Benzene	0.40	0.25	0.43	0.27
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.26	0.22
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.3	0.87
Tetrachloroethene	0.10	0.084	0.12	0.097
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.58	0.41
o-Xylene	0.10	0.076	0.17	0.13
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20176 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: ENGWESA008

Lab ID#: 1508373-04A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082814sim</b>	<b>Date of Collection:</b>	<b>8/19/15 10:18:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>8/28/15 12:47 PM</b>	
		<b>Date of Extraction:</b>	<b>8/28/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.21	0.13
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.57	0.43
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.26	0.16
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.38	0.28
Benzene	0.40	0.25	0.41	0.26
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.23	0.20
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	0.96	0.64
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.15	0.11
m,p-Xylene	0.10	0.071	0.52	0.37
o-Xylene	0.10	0.076	0.16	0.12
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20202 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: ENGWESA011

Lab ID#: 1508373-05A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082815sim</b>	<b>Date of Collection:</b>	<b>8/19/15 10:36:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>8/28/15 01:10 PM</b>	
		<b>Date of Extraction:</b>	<b>8/28/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.24	0.15
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	1.7	1.2
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.23	0.14
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	0.13	0.12
Carbon Tetrachloride	0.10	0.074	0.37	0.27
Benzene	0.40	0.25	0.70	0.43
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.48	0.41
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.2	0.77
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.53	0.37
o-Xylene	0.10	0.076	0.15	0.11
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20213 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: Duplicate

Lab ID#: 1508373-06A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082816sim</b>	<b>Date of Collection:</b>	<b>8/19/15 10:18:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>8/28/15 01:34 PM</b>	
		<b>Date of Extraction:</b>	<b>8/28/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.56	0.42
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.28	0.18
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.31	0.23
Benzene	0.40	0.25	0.42	0.26
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.28	0.24
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	0.95	0.64
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.15	0.11
m,p-Xylene	0.10	0.071	0.49	0.34
o-Xylene	0.10	0.076	0.14	0.11
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20202 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: TRIP BLANK

Lab ID#: 1508373-07A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082817sim</b>	<b>Date of Collection:</b> NA		
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b> 8/28/15 01:58 PM		
		<b>Date of Extraction:</b> 8/28/15		
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.55	Not Detected	Not Detected
Acetone	0.20	0.15	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.086	Not Detected	Not Detected
Hexane	0.10	0.085	Not Detected	Not Detected
Ethyl Acetate	0.40	0.29	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.071	Not Detected	Not Detected
Chloroform	0.10	0.075	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.091	Not Detected	Not Detected
Cyclohexane	0.10	0.10	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.084	Not Detected	Not Detected
Benzene	0.40	0.28	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.073	Not Detected	Not Detected
Heptane	0.10	0.097	Not Detected	Not Detected
Trichloroethene	0.10	0.082	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.17	Not Detected	Not Detected
Toluene	0.10	0.076	Not Detected	Not Detected
Tetrachloroethene	0.10	0.095	Not Detected	Not Detected
Chlorobenzene	0.10	0.083	Not Detected	Not Detected
Ethyl Benzene	0.10	0.083	Not Detected	Not Detected
m,p-Xylene	0.10	0.080	Not Detected	Not Detected
o-Xylene	0.10	0.086	Not Detected	Not Detected
Styrene	0.10	0.092	Not Detected	Not Detected
Propylbenzene	0.10	0.099	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.11	Not Detected	Not Detected
Naphthalene	0.10	0.22	Not Detected	Not Detected

Temperature = 32.0F , duration time = 20278 minutes.

Container Type: Radiello 130 (Solvent)

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	106	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1508373-08A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082806sim</b>	<b>Date of Collection: NA</b>		
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 8/28/15 09:36 AM</b>		
		<b>Date of Extraction: 8/28/15</b>		
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.55	Not Detected	Not Detected
Acetone	0.20	0.15	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.086	Not Detected	Not Detected
Hexane	0.10	0.085	Not Detected	Not Detected
Ethyl Acetate	0.40	0.29	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.071	Not Detected	Not Detected
Chloroform	0.10	0.075	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.091	Not Detected	Not Detected
Cyclohexane	0.10	0.10	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.084	Not Detected	Not Detected
Benzene	0.40	0.28	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.073	Not Detected	Not Detected
Heptane	0.10	0.097	Not Detected	Not Detected
Trichloroethene	0.10	0.082	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.17	Not Detected	Not Detected
Toluene	0.10	0.076	Not Detected	Not Detected
Tetrachloroethene	0.10	0.095	Not Detected	Not Detected
Chlorobenzene	0.10	0.083	Not Detected	Not Detected
Ethyl Benzene	0.10	0.083	Not Detected	Not Detected
m,p-Xylene	0.10	0.080	Not Detected	Not Detected
o-Xylene	0.10	0.086	Not Detected	Not Detected
Styrene	0.10	0.092	Not Detected	Not Detected
Propylbenzene	0.10	0.099	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.11	Not Detected	Not Detected
Naphthalene	0.10	0.22	Not Detected	Not Detected

Temperature = 32.0F , duration time = 20278 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: LCS

Lab ID#: 1508373-09A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10082804sim</b>	<b>Date of Collection:</b> NA
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b> 8/28/15 08:47 AM
		<b>Date of Extraction:</b> 8/28/15

<b>Compound</b>	<b>%Recovery</b>	<b>Method Limits</b>
Ethanol	114	50-130
Acetone	109	70-130
Methyl tert-butyl ether	109	70-130
Hexane	82	70-130
Ethyl Acetate	101	70-130
2-Butanone (Methyl Ethyl Ketone)	95	70-130
Chloroform	113	70-130
1,1,1-Trichloroethane	88	70-130
Cyclohexane	83	70-130
Carbon Tetrachloride	104	70-130
Benzene	122	70-130
1,2-Dichloroethane	92	70-130
Heptane	132 Q	70-130
Trichloroethene	100	70-130
4-Methyl-2-pentanone	98	70-130
Toluene	89	70-130
Tetrachloroethene	101	70-130
Chlorobenzene	86	70-130
Ethyl Benzene	94	70-130
m,p-Xylene	98	70-130
o-Xylene	87	70-130
Styrene	62	20-100
Propylbenzene	104	70-130
1,4-Dichlorobenzene	82	50-110
Naphthalene	17	5-80

Q = Exceeds Quality Control limits.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: LCSD

Lab ID#: 1508373-09AA

**VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	10082805sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	8/28/15 09:10 AM
		Date of Extraction:	8/28/15

Compound	%Recovery	Method Limits
Ethanol	95	50-130
Acetone	96	70-130
Methyl tert-butyl ether	98	70-130
Hexane	91	70-130
Ethyl Acetate	94	70-130
2-Butanone (Methyl Ethyl Ketone)	91	70-130
Chloroform	110	70-130
1,1,1-Trichloroethane	92	70-130
Cyclohexane	86	70-130
Carbon Tetrachloride	94	70-130
Benzene	108	70-130
1,2-Dichloroethane	86	70-130
Heptane	115	70-130
Trichloroethene	98	70-130
4-Methyl-2-pentanone	97	70-130
Toluene	89	70-130
Tetrachloroethene	95	70-130
Chlorobenzene	86	70-130
Ethyl Benzene	93	70-130
m,p-Xylene	93	70-130
o-Xylene	83	70-130
Styrene	59	20-100
Propylbenzene	96	70-130
1,4-Dichlorobenzene	79	50-110
Naphthalene	15	5-80

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130

9/17/2015  
Ms. Cecilia Greene  
Auxier & Associates, Inc.  
9821 Cogdill Road, Suite 1

Knoxville TN 37932

Project Name: Westlake Landfill  
Project #:  
Workorder #: 1509045

Dear Ms. Cecilia Greene

The following report includes the data for the above referenced project for sample(s) received on 9/3/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. RAD130/SKC are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**A Eurofins Lancaster Laboratories Company**

**WORK ORDER #:** 1509045

## Work Order Summary

<b>CLIENT:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932	<b>BILL TO:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932
<b>PHONE:</b>	865-675-3669	<b>P.O. #</b>	
<b>FAX:</b>	865-675-3677	<b>PROJECT #</b>	Westlake Landfill
<b>DATE RECEIVED:</b>	09/03/2015	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	09/17/2015		

<b><u>FRACTION #</u></b>	<b><u>NAME</u></b>	<b><u>TEST</u></b>
01A	ENGWESA001	Passive S.E. RAD130/SKC
02A	ENGWESA005	Passive S.E. RAD130/SKC
03A	ENGWESA007	Passive S.E. RAD130/SKC
04A	ENGWESA008	Passive S.E. RAD130/SKC
05A	ENGWESA011	Passive S.E. RAD130/SKC
06A	Duplicate	Passive S.E. RAD130/SKC
07A	TRIP BLANK	Passive S.E. RAD130/SKC
08A	Lab Blank	Passive S.E. RAD130/SKC
09A	LCS	Passive S.E. RAD130/SKC
09AA	LCSD	Passive S.E. RAD130/SKC

CERTIFIED BY:



DATE: 09/17/15

Technical Director

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563  
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE**  
**Passive SE GC/MS**  
**Auxier & Associates, Inc.**  
**Workorder# 1509045**

Seven Radiello 130 (Solvent) samples were received on September 03, 2015. The laboratory extracted the charcoal sorbent bed of the passive sampler using carbon disulfide. An aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

#### **Receiving Notes**

There were no receiving discrepancies.

#### **Analytical Notes**

The uptake rates were corrected based on average field temperatures if provided. In the absence of field temperatures, the uptake rates determined at 25 deg C were used.

To calculate ug/m<sup>3</sup> concentrations in the Lab Blank and Trip Blank, a sampling duration of 20180 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

Naphthalene was detected in the laboratory blank.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page.

#### **Definition of Data Qualifying Flags**

Nine qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector  
r1-File was requantified for the purpose of reissue



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA001****Lab ID#: 1509045-01A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Hexane	0.10	0.075	0.56	0.42
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.29	0.18
Cyclohexane	0.10	0.092	0.15	0.14
Carbon Tetrachloride	0.10	0.074	0.44	0.33
Benzene	0.40	0.25	0.52	0.32
Heptane	0.10	0.086	0.36	0.31
Toluene	0.10	0.067	1.2	0.82
Tetrachloroethene	0.10	0.084	0.23	0.20
Ethyl Benzene	0.10	0.073	0.18	0.13
m,p-Xylene	0.10	0.071	0.52	0.37
o-Xylene	0.10	0.077	0.19	0.15

**Client Sample ID: ENGWESA005****Lab ID#: 1509045-02A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Hexane	0.10	0.075	0.68	0.51
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.30	0.19
Chloroform	0.10	0.066	0.11	0.076
Cyclohexane	0.10	0.092	0.12	0.11
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.48	0.30
Heptane	0.10	0.085	0.30	0.25
Toluene	0.10	0.067	1.2	0.82
Tetrachloroethene	0.10	0.084	0.12	0.10
Ethyl Benzene	0.10	0.073	0.19	0.14
m,p-Xylene	0.10	0.071	0.55	0.39
o-Xylene	0.10	0.076	0.20	0.15

**Client Sample ID: ENGWESA007****Lab ID#: 1509045-03A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
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Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA007**

**Lab ID#: 1509045-03A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.22	0.14
Hexane	0.10	0.075	0.82	0.62
Ethyl Acetate	0.40	0.25	0.71	0.45
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.32	0.20
Cyclohexane	0.10	0.092	0.16	0.14
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.56	0.35
Heptane	0.10	0.085	0.33	0.28
Toluene	0.10	0.067	1.6	1.0
Tetrachloroethene	0.10	0.084	0.15	0.12
Ethyl Benzene	0.10	0.073	0.23	0.16
m,p-Xylene	0.10	0.071	0.66	0.46
o-Xylene	0.10	0.076	0.23	0.18

**Client Sample ID: ENGWESA008**

**Lab ID#: 1509045-04A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Hexane	0.10	0.075	0.53	0.40
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.25	0.16
Carbon Tetrachloride	0.10	0.074	0.44	0.32
Benzene	0.40	0.25	0.50	0.31
Heptane	0.10	0.085	0.22	0.19
Toluene	0.10	0.067	1.0	0.67
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.48	0.34
o-Xylene	0.10	0.076	0.17	0.13

**Client Sample ID: ENGWESA011**

**Lab ID#: 1509045-05A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Hexane	0.10	0.075	0.62	0.47



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA011****Lab ID#: 1509045-05A**

2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.24	0.15
Carbon Tetrachloride	0.10	0.074	0.35	0.26
Benzene	0.40	0.25	0.45	0.28
Heptane	0.10	0.086	0.20	0.17
Toluene	0.10	0.067	0.85	0.57
Ethyl Benzene	0.10	0.073	0.13	0.096
m,p-Xylene	0.10	0.071	0.37	0.26
o-Xylene	0.10	0.076	0.13	0.10

**Client Sample ID: Duplicate****Lab ID#: 1509045-06A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Hexane	0.10	0.075	0.44	0.33
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.25	0.16
Cyclohexane	0.10	0.092	0.13	0.12
Carbon Tetrachloride	0.10	0.074	0.37	0.27
Benzene	0.40	0.25	0.43	0.27
Heptane	0.10	0.086	0.31	0.27
Toluene	0.10	0.067	1.0	0.71
Tetrachloroethene	0.10	0.084	0.20	0.17
Ethyl Benzene	0.10	0.073	0.16	0.12
m,p-Xylene	0.10	0.071	0.45	0.32
o-Xylene	0.10	0.077	0.16	0.13

**Client Sample ID: TRIP BLANK****Lab ID#: 1509045-07A**

No Detections Were Found.



Air Toxics

Client Sample ID: ENGWESA001

Lab ID#: 1509045-01A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091408sim	<b>Date of Collection:</b>	9/2/15 9:50:00 AM	
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b>	9/14/15 03:24 PM	
		<b>Date of Extraction:</b>	9/14/15	
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.077	Not Detected	Not Detected
Hexane	0.10	0.075	0.56	0.42
Ethyl Acetate	0.40	0.26	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.29	0.18
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	0.15	0.14
Carbon Tetrachloride	0.10	0.074	0.44	0.33
Benzene	0.40	0.25	0.52	0.32
1,2-Dichloroethane	0.10	0.065	Not Detected	Not Detected
Heptane	0.10	0.086	0.36	0.31
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.2	0.82
Tetrachloroethene	0.10	0.084	0.23	0.20
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.18	0.13
m,p-Xylene	0.10	0.071	0.52	0.37
o-Xylene	0.10	0.077	0.19	0.15
Styrene	0.10	0.082	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.098	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20075 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Air Toxics

Client Sample ID: ENGWESA005

Lab ID#: 1509045-02A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091409sim	<b>Date of Collection:</b>	9/2/15 10:15:00 AM	
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b>	9/14/15 03:49 PM	
		<b>Date of Extraction:</b>	9/14/15	
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.68	0.51
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.30	0.19
Chloroform	0.10	0.066	0.11	0.076
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	0.12	0.11
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.48	0.30
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.30	0.25
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.2	0.82
Tetrachloroethene	0.10	0.084	0.12	0.10
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.19	0.14
m,p-Xylene	0.10	0.071	0.55	0.39
o-Xylene	0.10	0.076	0.20	0.15
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20175 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: ENGWESA007

Lab ID#: 1509045-03A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091410sim	<b>Date of Collection:</b>	9/2/15 10:05:00 AM	
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b>	9/14/15 04:13 PM	
		<b>Date of Extraction:</b>	9/14/15	
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.22	0.14
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.82	0.62
Ethyl Acetate	0.40	0.25	0.71	0.45
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.32	0.20
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	0.16	0.14
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.56	0.35
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.33	0.28
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.6	1.0
Tetrachloroethene	0.10	0.084	0.15	0.12
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.23	0.16
m,p-Xylene	0.10	0.071	0.66	0.46
o-Xylene	0.10	0.076	0.23	0.18
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20180 minutes.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Air Toxics

Client Sample ID: ENGWESA008

Lab ID#: 1509045-04A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091411sim	<b>Date of Collection:</b>	9/2/15 10:26:00 AM	
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b>	9/14/15 04:37 PM	
		<b>Date of Extraction:</b>	9/14/15	
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.53	0.40
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.25	0.16
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.44	0.32
Benzene	0.40	0.25	0.50	0.31
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.22	0.19
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.0	0.67
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.48	0.34
o-Xylene	0.10	0.076	0.17	0.13
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20168 minutes.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: ENGWESA011

Lab ID#: 1509045-05A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091412sim	<b>Date of Collection:</b>	9/2/15 10:33:00 AM	
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b>	9/14/15 05:01 PM	
		<b>Date of Extraction:</b>	9/14/15	
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.62	0.47
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.24	0.15
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.35	0.26
Benzene	0.40	0.25	0.45	0.28
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.086	0.20	0.17
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	0.85	0.57
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.13	0.096
m,p-Xylene	0.10	0.071	0.37	0.26
o-Xylene	0.10	0.076	0.13	0.10
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20157 minutes.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: Duplicate

Lab ID#: 1509045-06A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091413sim	<b>Date of Collection:</b>	9/2/15 9:50:00 AM	
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b>	9/14/15 05:26 PM	
		<b>Date of Extraction:</b>	9/14/15	
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.077	Not Detected	Not Detected
Hexane	0.10	0.075	0.44	0.33
Ethyl Acetate	0.40	0.26	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.25	0.16
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	0.13	0.12
Carbon Tetrachloride	0.10	0.074	0.37	0.27
Benzene	0.40	0.25	0.43	0.27
1,2-Dichloroethane	0.10	0.065	Not Detected	Not Detected
Heptane	0.10	0.086	0.31	0.27
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.0	0.71
Tetrachloroethene	0.10	0.084	0.20	0.17
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.16	0.12
m,p-Xylene	0.10	0.071	0.45	0.32
o-Xylene	0.10	0.077	0.16	0.13
Styrene	0.10	0.082	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.098	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20075 minutes.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130



Air Toxics

Client Sample ID: TRIP BLANK

Lab ID#: 1509045-07A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091414sim	<b>Date of Collection:</b> NA		
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b> 9/14/15 05:50 PM		
		<b>Date of Extraction:</b> 9/14/15		
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	Not Detected	Not Detected
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	Not Detected	Not Detected
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	Not Detected	Not Detected
Benzene	0.40	0.25	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	Not Detected	Not Detected
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	Not Detected	Not Detected
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	Not Detected	Not Detected
m,p-Xylene	0.10	0.071	Not Detected	Not Detected
o-Xylene	0.10	0.076	Not Detected	Not Detected
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20180 minutes.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1509045-08A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091407sim	<b>Date of Collection:</b> NA		
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b> 9/14/15 03:00 PM		
		<b>Date of Extraction:</b> 9/14/15		
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	Not Detected	Not Detected
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	Not Detected	Not Detected
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	Not Detected	Not Detected
Benzene	0.40	0.25	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	Not Detected	Not Detected
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	Not Detected	Not Detected
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	Not Detected	Not Detected
m,p-Xylene	0.10	0.071	Not Detected	Not Detected
o-Xylene	0.10	0.076	Not Detected	Not Detected
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	0.11	0.22

Temperature = 77.0F , duration time = 20180 minutes.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: LCS

Lab ID#: 1509045-09A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	c091404sim	<b>Date of Collection:</b> NA
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b> 9/14/15 01:44 PM
		<b>Date of Extraction:</b> 9/14/15

Compound	%Recovery	Method Limits
Ethanol	80	50-130
Acetone	102	70-130
Methyl tert-butyl ether	114	70-130
Hexane	132 Q	70-130
Ethyl Acetate	108	70-130
2-Butanone (Methyl Ethyl Ketone)	106	70-130
Chloroform	102	70-130
1,1,1-Trichloroethane	109	70-130
Cyclohexane	113	70-130
Carbon Tetrachloride	110	70-130
Benzene	111	70-130
1,2-Dichloroethane	103	70-130
Heptane	106	70-130
Trichloroethene	110	70-130
4-Methyl-2-pentanone	104	70-130
Toluene	100	70-130
Tetrachloroethene	108	70-130
Chlorobenzene	95	70-130
Ethyl Benzene	109	70-130
m,p-Xylene	104	70-130
o-Xylene	108	70-130
Styrene	70	20-100
Propylbenzene	95	70-130
1,4-Dichlorobenzene	85	50-110
Naphthalene	18	5-80

Q = Exceeds Quality Control limits.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: LCSD

Lab ID#: 1509045-09AA

**VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	c091405sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	9/14/15 02:11 PM
		Date of Extraction:	9/14/15

Compound	%Recovery	Method Limits
Ethanol	73	50-130
Acetone	94	70-130
Methyl tert-butyl ether	107	70-130
Hexane	121	70-130
Ethyl Acetate	102	70-130
2-Butanone (Methyl Ethyl Ketone)	99	70-130
Chloroform	95	70-130
1,1,1-Trichloroethane	105	70-130
Cyclohexane	109	70-130
Carbon Tetrachloride	106	70-130
Benzene	107	70-130
1,2-Dichloroethane	94	70-130
Heptane	98	70-130
Trichloroethene	106	70-130
4-Methyl-2-pentanone	98	70-130
Toluene	94	70-130
Tetrachloroethene	107	70-130
Chlorobenzene	90	70-130
Ethyl Benzene	102	70-130
m,p-Xylene	100	70-130
o-Xylene	112	70-130
Styrene	66	20-100
Propylbenzene	90	70-130
1,4-Dichlorobenzene	83	50-110
Naphthalene	14	5-80

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130

9/30/2015  
Ms. Cecilia Greene  
Auxier & Associates, Inc.  
9821 Cogdill Road, Suite 1

Knoxville TN 37932

Project Name: Westlake Landfill  
Project #:  
Workorder #: 1509264

Dear Ms. Cecilia Greene

The following report includes the data for the above referenced project for sample(s) received on 9/17/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. RAD130/SKC are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**A Eurofins Lancaster Laboratories Company**

**WORK ORDER #:** 1509264

## Work Order Summary

<b>CLIENT:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932	<b>BILL TO:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932
<b>PHONE:</b>	865-675-3669	<b>P.O. #</b>	
<b>FAX:</b>	865-675-3677	<b>PROJECT #</b>	Westlake Landfill
<b>DATE RECEIVED:</b>	09/17/2015	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	09/30/2015		

<b><u>FRACTION #</u></b>	<b><u>NAME</u></b>	<b><u>TEST</u></b>
01A	ENGWESA001	Passive S.E. RAD130/SKC
02A	ENGWESA005	Passive S.E. RAD130/SKC
03A	ENGWESA007	Passive S.E. RAD130/SKC
04A	ENGWESA008	Passive S.E. RAD130/SKC
05A	ENGWESA011	Passive S.E. RAD130/SKC
06A	Duplicate	Passive S.E. RAD130/SKC
07A	TRIP BLANK	Passive S.E. RAD130/SKC
08A	Lab Blank	Passive S.E. RAD130/SKC
09A	LCS	Passive S.E. RAD130/SKC
09AA	LCSD	Passive S.E. RAD130/SKC

CERTIFIED BY:



DATE: 09/30/15

Technical Director

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563  
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE  
Passive SE GC/MS  
Auxier & Associates, Inc.  
Workorder# 1509264**

Seven Radiello 130 (Solvent) samples were received on September 17, 2015. The laboratory extracted the charcoal sorbent bed of the passive sampler using carbon disulfide. An aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

#### **Receiving Notes**

There were no receiving discrepancies.

#### **Analytical Notes**

The uptake rates were corrected based on average field temperatures if provided. In the absence of field temperatures, the uptake rates determined at 25 deg C were used.

To calculate ug/m<sup>3</sup> concentrations in the Lab Blank and Trip Blank, a sampling duration of 20352 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

The Relative Percent Difference (RPD) of the LCS/LCSD exceeded acceptance limits for Naphthalene.

#### **Definition of Data Qualifying Flags**

Nine qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA001****Lab ID#: 1509264-01A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.30	0.19
Hexane	0.10	0.075	0.74	0.55
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.20	0.12
Carbon Tetrachloride	0.10	0.074	0.45	0.33
Benzene	0.40	0.25	0.40	0.25
Heptane	0.10	0.085	0.30	0.26
Toluene	0.10	0.067	0.81	0.54
Tetrachloroethene	0.10	0.084	0.23	0.20
Ethyl Benzene	0.10	0.073	0.13	0.092
m,p-Xylene	0.10	0.070	0.42	0.30
o-Xylene	0.10	0.076	0.12	0.095

**Client Sample ID: ENGWESA005****Lab ID#: 1509264-02A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.47	0.30
Hexane	0.10	0.074	0.81	0.60
Ethyl Acetate	0.40	0.25	0.44	0.28
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.32	0.20
Chloroform	0.10	0.066	0.10	0.069
Cyclohexane	0.10	0.091	0.11	0.097
Carbon Tetrachloride	0.10	0.073	0.53	0.39
Benzene	0.40	0.24	0.68	0.42
Heptane	0.10	0.085	0.28	0.24
Toluene	0.10	0.066	1.0	0.67
Tetrachloroethene	0.10	0.083	0.12	0.098
Ethyl Benzene	0.10	0.072	0.15	0.11
m,p-Xylene	0.10	0.070	0.50	0.35
o-Xylene	0.10	0.076	0.15	0.12



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA007****Lab ID#: 1509264-03A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.35	0.22
Hexane	0.10	0.074	0.58	0.44
Ethyl Acetate	0.40	0.25	0.54	0.34
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.21	0.13
Cyclohexane	0.10	0.091	0.11	0.10
Carbon Tetrachloride	0.10	0.073	0.38	0.28
Benzene	0.40	0.24	0.45	0.28
Heptane	0.10	0.085	0.30	0.26
Toluene	0.10	0.066	1.2	0.80
Tetrachloroethene	0.10	0.083	0.15	0.12
Ethyl Benzene	0.10	0.072	0.17	0.12
m,p-Xylene	0.10	0.070	0.58	0.41
o-Xylene	0.10	0.076	0.16	0.12

**Client Sample ID: ENGWESA008****Lab ID#: 1509264-04A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.38	0.24
Hexane	0.10	0.075	0.65	0.48
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.25	0.16
Carbon Tetrachloride	0.10	0.074	0.48	0.35
Benzene	0.40	0.25	0.47	0.29
Heptane	0.10	0.085	0.21	0.18
Toluene	0.10	0.066	0.89	0.59
Tetrachloroethene	0.10	0.083	0.12	0.10
Ethyl Benzene	0.10	0.072	0.13	0.096
m,p-Xylene	0.10	0.070	0.46	0.32
o-Xylene	0.10	0.076	0.13	0.10

**Client Sample ID: ENGWESA011****Lab ID#: 1509264-05A**

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA011**

**Lab ID#: 1509264-05A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.44	0.28
Hexane	0.10	0.074	0.61	0.46
Ethyl Acetate	0.40	0.25	0.40	0.25
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.31	0.19
Cyclohexane	0.10	0.091	0.14	0.12
Carbon Tetrachloride	0.10	0.073	0.44	0.32
Benzene	0.40	0.24	0.53	0.32
Heptane	0.10	0.085	0.27	0.23
Toluene	0.10	0.066	1.0	0.67
Tetrachloroethene	0.10	0.083	0.12	0.10
Ethyl Benzene	0.10	0.072	0.15	0.11
m,p-Xylene	0.10	0.070	0.49	0.34
o-Xylene	0.10	0.076	0.14	0.10

**Client Sample ID: Duplicate**

**Lab ID#: 1509264-06A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.49	0.31
Hexane	0.10	0.074	0.60	0.45
Ethyl Acetate	0.40	0.25	0.78	0.49
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.31	0.19
Chloroform	0.10	0.066	0.11	0.072
Cyclohexane	0.10	0.091	0.15	0.13
Carbon Tetrachloride	0.10	0.073	0.64	0.47
Benzene	0.40	0.24	0.63	0.39
Heptane	0.10	0.085	0.32	0.27
Toluene	0.10	0.066	1.4	0.95
Tetrachloroethene	0.10	0.083	0.18	0.15
Ethyl Benzene	0.10	0.072	0.21	0.15
m,p-Xylene	0.10	0.070	0.72	0.51
o-Xylene	0.10	0.076	0.21	0.16

**Summary of Detected Compounds  
VOCS BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: TRIP BLANK**

**Lab ID#: 1509264-07A**

No Detections Were Found.



Air Toxics

Client Sample ID: ENGWESA001

Lab ID#: 1509264-01A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092112sim</b>	<b>Date of Collection:</b>	<b>9/16/15 11:18:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>9/21/15 02:02 PM</b>	
		<b>Date of Extraction:</b>	<b>9/21/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.30	0.19
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.74	0.55
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.20	0.12
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.091	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.45	0.33
Benzene	0.40	0.25	0.40	0.25
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.30	0.26
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	0.81	0.54
Tetrachloroethene	0.10	0.084	0.23	0.20
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.13	0.092
m,p-Xylene	0.10	0.070	0.42	0.30
o-Xylene	0.10	0.076	0.12	0.095
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20243 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	105	70-130



Air Toxics

Client Sample ID: ENGWESA005

Lab ID#: 1509264-02A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092113sim</b>	<b>Date of Collection:</b>	<b>9/16/15 1:07:00 PM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>9/21/15 02:26 PM</b>	
		<b>Date of Extraction:</b>	<b>9/21/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.47	0.30
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.074	0.81	0.60
Ethyl Acetate	0.40	0.25	0.44	0.28
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.32	0.20
Chloroform	0.10	0.066	0.10	0.069
1,1,1-Trichloroethane	0.10	0.079	Not Detected	Not Detected
Cyclohexane	0.10	0.091	0.11	0.097
Carbon Tetrachloride	0.10	0.073	0.53	0.39
Benzene	0.40	0.24	0.68	0.42
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.28	0.24
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.066	1.0	0.67
Tetrachloroethene	0.10	0.083	0.12	0.098
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	0.15	0.11
m,p-Xylene	0.10	0.070	0.50	0.35
o-Xylene	0.10	0.076	0.15	0.12
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.096	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20327 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: ENGWESA007

Lab ID#: 1509264-03A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092114sim</b>	<b>Date of Collection:</b>	<b>9/16/15 1:22:00 PM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>9/21/15 02:50 PM</b>	
		<b>Date of Extraction:</b>	<b>9/21/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.35	0.22
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.074	0.58	0.44
Ethyl Acetate	0.40	0.25	0.54	0.34
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.21	0.13
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.079	Not Detected	Not Detected
Cyclohexane	0.10	0.091	0.11	0.10
Carbon Tetrachloride	0.10	0.073	0.38	0.28
Benzene	0.40	0.24	0.45	0.28
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.30	0.26
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.066	1.2	0.80
Tetrachloroethene	0.10	0.083	0.15	0.12
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	0.17	0.12
m,p-Xylene	0.10	0.070	0.58	0.41
o-Xylene	0.10	0.076	0.16	0.12
Styrene	0.10	0.080	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.096	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20352 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: ENGWESA008

Lab ID#: 1509264-04A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092115sim</b>	<b>Date of Collection:</b>	<b>9/16/15 12:51:00 PM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>9/21/15 03:14 PM</b>	
		<b>Date of Extraction:</b>	<b>9/21/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.38	0.24
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.65	0.48
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.25	0.16
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.079	Not Detected	Not Detected
Cyclohexane	0.10	0.091	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	0.48	0.35
Benzene	0.40	0.25	0.47	0.29
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.21	0.18
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.066	0.89	0.59
Tetrachloroethene	0.10	0.083	0.12	0.10
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	0.13	0.096
m,p-Xylene	0.10	0.070	0.46	0.32
o-Xylene	0.10	0.076	0.13	0.10
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.096	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20301 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: ENGWESA011

Lab ID#: 1509264-05A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092116sim</b>	<b>Date of Collection:</b>	<b>9/16/15 1:37:00 PM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>9/21/15 03:38 PM</b>	
		<b>Date of Extraction:</b>	<b>9/21/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.44	0.28
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.074	0.61	0.46
Ethyl Acetate	0.40	0.25	0.40	0.25
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.31	0.19
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.079	Not Detected	Not Detected
Cyclohexane	0.10	0.091	0.14	0.12
Carbon Tetrachloride	0.10	0.073	0.44	0.32
Benzene	0.40	0.24	0.53	0.32
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.27	0.23
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.066	1.0	0.67
Tetrachloroethene	0.10	0.083	0.12	0.10
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	0.15	0.11
m,p-Xylene	0.10	0.070	0.49	0.34
o-Xylene	0.10	0.076	0.14	0.10
Styrene	0.10	0.080	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.096	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20341 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: Duplicate

Lab ID#: 1509264-06A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092117sim</b>	<b>Date of Collection:</b>	<b>9/16/15 1:22:00 PM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>9/21/15 04:02 PM</b>	
<b>Date of Extraction:</b> 9/21/15				
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.49	0.31
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.074	0.60	0.45
Ethyl Acetate	0.40	0.25	0.78	0.49
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	0.31	0.19
Chloroform	0.10	0.066	0.11	0.072
1,1,1-Trichloroethane	0.10	0.079	Not Detected	Not Detected
Cyclohexane	0.10	0.091	0.15	0.13
Carbon Tetrachloride	0.10	0.073	0.64	0.47
Benzene	0.40	0.24	0.63	0.39
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.32	0.27
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.066	1.4	0.95
Tetrachloroethene	0.10	0.083	0.18	0.15
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	0.21	0.15
m,p-Xylene	0.10	0.070	0.72	0.51
o-Xylene	0.10	0.076	0.21	0.16
Styrene	0.10	0.080	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.096	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20352 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130



Air Toxics

Client Sample ID: TRIP BLANK

Lab ID#: 1509264-07A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092118sim</b>	<b>Date of Collection:</b> NA		
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b> 9/21/15 04:26 PM		
		<b>Date of Extraction:</b> 9/21/15		
Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.074	Not Detected	Not Detected
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	Not Detected	Not Detected
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.079	Not Detected	Not Detected
Cyclohexane	0.10	0.091	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.073	Not Detected	Not Detected
Benzene	0.40	0.24	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	Not Detected	Not Detected
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.066	Not Detected	Not Detected
Tetrachloroethene	0.10	0.083	Not Detected	Not Detected
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	Not Detected	Not Detected
m,p-Xylene	0.10	0.070	Not Detected	Not Detected
o-Xylene	0.10	0.076	Not Detected	Not Detected
Styrene	0.10	0.080	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.096	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20352 minutes.

**Container Type: Radiello 130 (Solvent)**

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1509264-08A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10092107sim</b>	<b>Date of Collection: NA</b>		
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 9/21/15 12:01 PM</b>		
		<b>Date of Extraction: 9/21/15</b>		
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.074	Not Detected	Not Detected
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.062	Not Detected	Not Detected
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.079	Not Detected	Not Detected
Cyclohexane	0.10	0.091	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.073	Not Detected	Not Detected
Benzene	0.40	0.24	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	Not Detected	Not Detected
Trichloroethene	0.10	0.071	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.066	Not Detected	Not Detected
Tetrachloroethene	0.10	0.083	Not Detected	Not Detected
Chlorobenzene	0.10	0.072	Not Detected	Not Detected
Ethyl Benzene	0.10	0.072	Not Detected	Not Detected
m,p-Xylene	0.10	0.070	Not Detected	Not Detected
o-Xylene	0.10	0.076	Not Detected	Not Detected
Styrene	0.10	0.080	Not Detected	Not Detected
Propylbenzene	0.10	0.086	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.096	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20352 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: LCS

Lab ID#: 1509264-09A

**VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	10092105sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	9/21/15 11:13 AM
		Date of Extraction:	9/21/15

Compound	%Recovery	Method Limits
Ethanol	126	50-130
Acetone	121	70-130
Methyl tert-butyl ether	125	70-130
Hexane	115	70-130
Ethyl Acetate	114	70-130
2-Butanone (Methyl Ethyl Ketone)	110	70-130
Chloroform	107	70-130
1,1,1-Trichloroethane	120	70-130
Cyclohexane	113	70-130
Carbon Tetrachloride	108	70-130
Benzene	104	70-130
1,2-Dichloroethane	102	70-130
Heptane	117	70-130
Trichloroethene	111	70-130
4-Methyl-2-pentanone	102	70-130
Toluene	91	70-130
Tetrachloroethene	109	70-130
Chlorobenzene	84	70-130
Ethyl Benzene	93	70-130
m,p-Xylene	107	70-130
o-Xylene	98	70-130
Styrene	64	20-100
Propylbenzene	112	70-130
1,4-Dichlorobenzene	87	50-110
Naphthalene	13	5-80

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: LCSD

Lab ID#: 1509264-09AA

**VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	10092106sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	9/21/15 11:36 AM
		Date of Extraction:	9/21/15

Compound	%Recovery	Method Limits
Ethanol	110	50-130
Acetone	112	70-130
Methyl tert-butyl ether	117	70-130
Hexane	114	70-130
Ethyl Acetate	109	70-130
2-Butanone (Methyl Ethyl Ketone)	105	70-130
Chloroform	100	70-130
1,1,1-Trichloroethane	115	70-130
Cyclohexane	111	70-130
Carbon Tetrachloride	111	70-130
Benzene	99	70-130
1,2-Dichloroethane	106	70-130
Heptane	101	70-130
Trichloroethene	108	70-130
4-Methyl-2-pentanone	100	70-130
Toluene	90	70-130
Tetrachloroethene	106	70-130
Chlorobenzene	84	70-130
Ethyl Benzene	93	70-130
m,p-Xylene	103	70-130
o-Xylene	90	70-130
Styrene	64	20-100
Propylbenzene	108	70-130
1,4-Dichlorobenzene	83	50-110
Naphthalene	9.8	5-80

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130

10/15/2015  
Ms. Cecilia Greene  
Auxier & Associates, Inc.  
9821 Cogdill Road, Suite 1

Knoxville TN 37932

Project Name: Westlake Landfill  
Project #:  
Workorder #: 1510016

Dear Ms. Cecilia Greene

The following report includes the data for the above referenced project for sample(s) received on 10/1/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. RAD130/SKC are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**A Eurofins Lancaster Laboratories Company**

**WORK ORDER #:** 1510016

## Work Order Summary

<b>CLIENT:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932	<b>BILL TO:</b>	Ms. Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37932
<b>PHONE:</b>	865-675-3669	<b>P.O. #</b>	
<b>FAX:</b>	865-675-3677	<b>PROJECT #</b>	Westlake Landfill
<b>DATE RECEIVED:</b>	10/01/2015	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	10/14/2015		

<b><u>FRACTION #</u></b>	<b><u>NAME</u></b>	<b><u>TEST</u></b>
01A	ENGWESA001	Passive S.E. RAD130/SKC
02A	ENGWESA005	Passive S.E. RAD130/SKC
03A	ENGWESA007	Passive S.E. RAD130/SKC
04A	ENGWESA008	Passive S.E. RAD130/SKC
05A	ENGWESA011	Passive S.E. RAD130/SKC
06A	Duplicate	Passive S.E. RAD130/SKC
07A	TRIP BLANK	Passive S.E. RAD130/SKC
08A	Lab Blank	Passive S.E. RAD130/SKC
09A	LCS	Passive S.E. RAD130/SKC
09AA	LCSD	Passive S.E. RAD130/SKC

CERTIFIED BY:



DATE: 10/14/15

Technical Director

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563  
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE  
Passive SE GC/MS  
Auxier & Associates, Inc.  
Workorder# 1510016**

Seven Radiello 130 (Solvent) samples were received on October 01, 2015. The laboratory extracted the charcoal sorbent bed of the passive sampler using carbon disulfide. An aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

#### **Receiving Notes**

There were no receiving discrepancies.

#### **Analytical Notes**

The uptake rates were corrected based on average field temperatures if provided. In the absence of field temperatures, the uptake rates determined at 25 deg C were used.

If validated uptake rates were not available, rates were estimated using the chemical's diffusion coefficient in air and the geometric constant of the sampler. Chemicals that are poorly retained by the sorbent over the sampling duration may exhibit a low bias. All concentrations calculated using estimated rates are qualified with a "C" flag.

To calculate ug/m<sup>3</sup> concentrations in the Lab Blank and Trip Blank, a sampling duration of 20203 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page.

#### **Definition of Data Qualifying Flags**

Nine qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA001****Lab ID#: 1510016-01A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.46	0.29
Hexane	0.10	0.075	0.69	0.52
Ethyl Acetate	0.40	0.25	0.51	0.33
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.34	0.22
Chloroform	0.10	0.066	0.16	0.11
Cyclohexane	0.10	0.092	0.14	0.13
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.66	0.41
Heptane	0.10	0.085	0.72	0.61
Toluene	0.10	0.067	1.2	0.79
Tetrachloroethene	0.10	0.084	0.44	0.37
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.56	0.39
o-Xylene	0.10	0.076	0.17	0.13

**Client Sample ID: ENGWESA005****Lab ID#: 1510016-02A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.50	0.32
Hexane	0.10	0.076	0.87	0.66
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.42	0.26
Chloroform	0.10	0.067	0.16	0.10
Cyclohexane	0.10	0.093	0.15	0.14
Carbon Tetrachloride	0.10	0.075	0.41	0.31
Benzene	0.40	0.25	0.63	0.39
Heptane	0.10	0.086	0.39	0.34
Toluene	0.10	0.068	1.3	0.89
Tetrachloroethene	0.10	0.085	0.16	0.14
Ethyl Benzene	0.10	0.074	0.18	0.13
m,p-Xylene	0.10	0.071	0.62	0.45
o-Xylene	0.10	0.077	0.20	0.15



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA007****Lab ID#: 1510016-03A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.53	0.34
Hexane	0.10	0.076	0.84	0.64
Ethyl Acetate	0.40	0.26	0.68	0.43
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.33	0.21
Chloroform	0.10	0.067	0.16	0.11
Cyclohexane	0.10	0.093	0.16	0.15
Carbon Tetrachloride	0.10	0.075	0.55	0.41
Benzene	0.40	0.25	0.67	0.42
Heptane	0.10	0.086	0.40	0.35
Toluene	0.10	0.068	1.7	1.2
Tetrachloroethene	0.10	0.085	0.20	0.17
Ethyl Benzene	0.10	0.074	0.23	0.17
m,p-Xylene	0.10	0.072	0.81	0.58
o-Xylene	0.10	0.077	0.25	0.19

**Client Sample ID: ENGWESA008****Lab ID#: 1510016-04A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.40	0.26
Hexane	0.10	0.076	0.57	0.43
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.31	0.20
Chloroform	0.10	0.067	0.13	0.086
Cyclohexane	0.10	0.093	0.12	0.11
Carbon Tetrachloride	0.10	0.075	0.36	0.27
Benzene	0.40	0.25	0.51	0.32
Heptane	0.10	0.086	0.34	0.29
Toluene	0.10	0.068	1.0	0.71
Tetrachloroethene	0.10	0.085	0.18	0.15
Ethyl Benzene	0.10	0.074	0.15	0.11
m,p-Xylene	0.10	0.071	0.53	0.38
o-Xylene	0.10	0.077	0.17	0.13



Air Toxics

## Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: ENGWESA011****Lab ID#: 1510016-05A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.44	0.28
Hexane	0.10	0.076	0.72	0.54
Ethyl Acetate	0.40	0.26	0.40	0.26
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.32	0.20
Chloroform	0.10	0.067	0.14	0.097
Cyclohexane	0.10	0.093	0.16	0.15
Carbon Tetrachloride	0.10	0.075	0.43	0.32
Benzene	0.40	0.25	0.62	0.39
Heptane	0.10	0.086	0.41	0.35
Toluene	0.10	0.068	1.3	0.87
Tetrachloroethene	0.10	0.085	0.23	0.20
Ethyl Benzene	0.10	0.074	0.20	0.15
m,p-Xylene	0.10	0.072	0.69	0.49
o-Xylene	0.10	0.077	0.22	0.17

**Client Sample ID: Duplicate****Lab ID#: 1510016-06A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Acetone	0.20	0.13	0.43	0.28
Hexane	0.10	0.076	1.0	0.78
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.33	0.21
Chloroform	0.10	0.067	0.18	0.12
Cyclohexane	0.10	0.093	0.11	0.10
Carbon Tetrachloride	0.10	0.075	0.50	0.38
Benzene	0.40	0.25	0.72	0.45
Heptane	0.10	0.086	0.30	0.26
Toluene	0.10	0.068	1.2	0.78
Tetrachloroethene	0.10	0.085	0.20	0.17
Ethyl Benzene	0.10	0.074	0.18	0.13
m,p-Xylene	0.10	0.072	0.57	0.41
o-Xylene	0.10	0.077	0.19	0.14

**Summary of Detected Compounds  
VOCS BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: TRIP BLANK**

**Lab ID#: 1510016-07A**

No Detections Were Found.



Air Toxics

Client Sample ID: ENGWESA001

Lab ID#: 1510016-01A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100511sim</b>	<b>Date of Collection:</b>	<b>9/30/15 12:03:00 PM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>10/5/15 12:43 PM</b>	
		<b>Date of Extraction:</b>	<b>10/5/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	0.46	0.29
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	0.69	0.52
Ethyl Acetate	0.40	0.25	0.51	0.33
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.34	0.22
Chloroform	0.10	0.066	0.16	0.11
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	0.14	0.13
Carbon Tetrachloride	0.10	0.074	0.46	0.34
Benzene	0.40	0.25	0.66	0.41
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	0.72	0.61
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	1.2	0.79
Tetrachloroethene	0.10	0.084	0.44	0.37
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	0.17	0.12
m,p-Xylene	0.10	0.071	0.56	0.39
o-Xylene	0.10	0.076	0.17	0.13
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20203 minutes.

Container Type: Radiello 130 (Solvent)

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: ENGWESA005

Lab ID#: 1510016-02A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100512sim</b>	<b>Date of Collection:</b>	<b>9/30/15 10:11:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>10/5/15 01:06 PM</b>	
		<b>Date of Extraction:</b>	<b>10/5/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	0.50	0.32
Methyl tert-butyl ether	0.10	0.077	Not Detected	Not Detected
Hexane	0.10	0.076	0.87	0.66
Ethyl Acetate	0.40	0.26	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.42	0.26
Chloroform	0.10	0.067	0.16	0.10
1,1,1-Trichloroethane	0.10	0.081	Not Detected	Not Detected
Cyclohexane	0.10	0.093	0.15	0.14
Carbon Tetrachloride	0.10	0.075	0.41	0.31
Benzene	0.40	0.25	0.63	0.39
1,2-Dichloroethane	0.10	0.065	Not Detected	Not Detected
Heptane	0.10	0.086	0.39	0.34
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.068	1.3	0.89
Tetrachloroethene	0.10	0.085	0.16	0.14
Chlorobenzene	0.10	0.074	Not Detected	Not Detected
Ethyl Benzene	0.10	0.074	0.18	0.13
m,p-Xylene	0.10	0.071	0.62	0.45
o-Xylene	0.10	0.077	0.20	0.15
Styrene	0.10	0.082	Not Detected	Not Detected
Propylbenzene	0.10	0.088	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.098	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 19982 minutes.

Container Type: Radiello 130 (Solvent)

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: ENGWESA007

Lab ID#: 1510016-03A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100513sim</b>	<b>Date of Collection:</b>	<b>9/30/15 10:19:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>10/5/15 01:30 PM</b>	
		<b>Date of Extraction:</b>	<b>10/5/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	0.53	0.34
Methyl tert-butyl ether	0.10	0.077	Not Detected	Not Detected
Hexane	0.10	0.076	0.84	0.64
Ethyl Acetate	0.40	0.26	0.68	0.43
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.33	0.21
Chloroform	0.10	0.067	0.16	0.11
1,1,1-Trichloroethane	0.10	0.081	Not Detected	Not Detected
Cyclohexane	0.10	0.093	0.16	0.15
Carbon Tetrachloride	0.10	0.075	0.55	0.41
Benzene	0.40	0.25	0.67	0.42
1,2-Dichloroethane	0.10	0.065	Not Detected	Not Detected
Heptane	0.10	0.086	0.40	0.35
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.068	1.7	1.2
Tetrachloroethene	0.10	0.085	0.20	0.17
Chlorobenzene	0.10	0.074	Not Detected	Not Detected
Ethyl Benzene	0.10	0.074	0.23	0.17
m,p-Xylene	0.10	0.072	0.81	0.58
o-Xylene	0.10	0.077	0.25	0.19
Styrene	0.10	0.082	Not Detected	Not Detected
Propylbenzene	0.10	0.088	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.098	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 19975 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: ENGWESA008

Lab ID#: 1510016-04A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100514sim</b>	<b>Date of Collection:</b>	<b>9/30/15 10:04:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>10/5/15 01:53 PM</b>	
		<b>Date of Extraction:</b>	<b>10/5/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	0.40	0.26
Methyl tert-butyl ether	0.10	0.077	Not Detected	Not Detected
Hexane	0.10	0.076	0.57	0.43
Ethyl Acetate	0.40	0.26	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.31	0.20
Chloroform	0.10	0.067	0.13	0.086
1,1,1-Trichloroethane	0.10	0.081	Not Detected	Not Detected
Cyclohexane	0.10	0.093	0.12	0.11
Carbon Tetrachloride	0.10	0.075	0.36	0.27
Benzene	0.40	0.25	0.51	0.32
1,2-Dichloroethane	0.10	0.065	Not Detected	Not Detected
Heptane	0.10	0.086	0.34	0.29
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.068	1.0	0.71
Tetrachloroethene	0.10	0.085	0.18	0.15
Chlorobenzene	0.10	0.074	Not Detected	Not Detected
Ethyl Benzene	0.10	0.074	0.15	0.11
m,p-Xylene	0.10	0.071	0.53	0.38
o-Xylene	0.10	0.077	0.17	0.13
Styrene	0.10	0.082	Not Detected	Not Detected
Propylbenzene	0.10	0.088	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.098	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 19992 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: ENGWESA011

Lab ID#: 1510016-05A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100515sim</b>	<b>Date of Collection:</b>	<b>9/30/15 10:28:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>10/5/15 02:16 PM</b>	
		<b>Date of Extraction:</b>	<b>10/5/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	0.44	0.28
Methyl tert-butyl ether	0.10	0.077	Not Detected	Not Detected
Hexane	0.10	0.076	0.72	0.54
Ethyl Acetate	0.40	0.26	0.40	0.26
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.32	0.20
Chloroform	0.10	0.067	0.14	0.097
1,1,1-Trichloroethane	0.10	0.081	Not Detected	Not Detected
Cyclohexane	0.10	0.093	0.16	0.15
Carbon Tetrachloride	0.10	0.075	0.43	0.32
Benzene	0.40	0.25	0.62	0.39
1,2-Dichloroethane	0.10	0.065	Not Detected	Not Detected
Heptane	0.10	0.086	0.41	0.35
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.068	1.3	0.87
Tetrachloroethene	0.10	0.085	0.23	0.20
Chlorobenzene	0.10	0.074	Not Detected	Not Detected
Ethyl Benzene	0.10	0.074	0.20	0.15
m,p-Xylene	0.10	0.072	0.69	0.49
o-Xylene	0.10	0.077	0.22	0.17
Styrene	0.10	0.082	Not Detected	Not Detected
Propylbenzene	0.10	0.088	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.098	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 19969 minutes.

Container Type: Radiello 130 (Solvent)

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: Duplicate

Lab ID#: 1510016-06A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100516sim</b>	<b>Date of Collection:</b>	<b>9/30/15 10:28:00 AM</b>	
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b>	<b>10/5/15 02:40 PM</b>	
		<b>Date of Extraction:</b>	<b>10/5/15</b>	
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.49	Not Detected	Not Detected
Acetone	0.20	0.13	0.43	0.28
Methyl tert-butyl ether	0.10	0.077	Not Detected	Not Detected
Hexane	0.10	0.076	1.0	0.78
Ethyl Acetate	0.40	0.26	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	0.33	0.21
Chloroform	0.10	0.067	0.18	0.12
1,1,1-Trichloroethane	0.10	0.081	Not Detected	Not Detected
Cyclohexane	0.10	0.093	0.11	0.10
Carbon Tetrachloride	0.10	0.075	0.50	0.38
Benzene	0.40	0.25	0.72	0.45
1,2-Dichloroethane	0.10	0.065	Not Detected	Not Detected
Heptane	0.10	0.086	0.30	0.26
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.068	1.2	0.78
Tetrachloroethene	0.10	0.085	0.20	0.17
Chlorobenzene	0.10	0.074	Not Detected	Not Detected
Ethyl Benzene	0.10	0.074	0.18	0.13
m,p-Xylene	0.10	0.072	0.57	0.41
o-Xylene	0.10	0.077	0.19	0.14
Styrene	0.10	0.082	Not Detected	Not Detected
Propylbenzene	0.10	0.088	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.098	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 19969 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: TRIP BLANK

Lab ID#: 1510016-07A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100510sim</b>	<b>Date of Collection: NA</b>		
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 10/5/15 12:20 PM</b>		
		<b>Date of Extraction: 10/5/15</b>		
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	Not Detected	Not Detected
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	Not Detected	Not Detected
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	Not Detected	Not Detected
Benzene	0.40	0.25	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	Not Detected	Not Detected
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	Not Detected	Not Detected
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	Not Detected	Not Detected
m,p-Xylene	0.10	0.071	Not Detected	Not Detected
o-Xylene	0.10	0.076	Not Detected	Not Detected
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20203 minutes.

Container Type: Radiello 130 (Solvent)

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1510016-08A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100509sim</b>	<b>Date of Collection: NA</b>		
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 10/5/15 11:56 AM</b>		
		<b>Date of Extraction: 10/5/15</b>		
<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Ethanol	1.0	0.48	Not Detected	Not Detected
Acetone	0.20	0.13	Not Detected	Not Detected
Methyl tert-butyl ether	0.10	0.076	Not Detected	Not Detected
Hexane	0.10	0.075	Not Detected	Not Detected
Ethyl Acetate	0.40	0.25	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.10	0.063	Not Detected	Not Detected
Chloroform	0.10	0.066	Not Detected	Not Detected
1,1,1-Trichloroethane	0.10	0.080	Not Detected	Not Detected
Cyclohexane	0.10	0.092	Not Detected	Not Detected
Carbon Tetrachloride	0.10	0.074	Not Detected	Not Detected
Benzene	0.40	0.25	Not Detected	Not Detected
1,2-Dichloroethane	0.10	0.064	Not Detected	Not Detected
Heptane	0.10	0.085	Not Detected	Not Detected
Trichloroethene	0.10	0.072	Not Detected	Not Detected
4-Methyl-2-pentanone	0.20	0.15	Not Detected	Not Detected
Toluene	0.10	0.067	Not Detected	Not Detected
Tetrachloroethene	0.10	0.084	Not Detected	Not Detected
Chlorobenzene	0.10	0.073	Not Detected	Not Detected
Ethyl Benzene	0.10	0.073	Not Detected	Not Detected
m,p-Xylene	0.10	0.071	Not Detected	Not Detected
o-Xylene	0.10	0.076	Not Detected	Not Detected
Styrene	0.10	0.081	Not Detected	Not Detected
Propylbenzene	0.10	0.087	Not Detected	Not Detected
1,4-Dichlorobenzene	0.10	0.097	Not Detected	Not Detected
Naphthalene	0.10	0.20	Not Detected	Not Detected

Temperature = 77.0F , duration time = 20203 minutes.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: LCS

Lab ID#: 1510016-09A

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100507sim</b>	<b>Date of Collection:</b> NA
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b> 10/5/15 11:06 AM
		<b>Date of Extraction:</b> 10/5/15

<b>Compound</b>	<b>%Recovery</b>	<b>Method Limits</b>
Ethanol	78	50-130
Acetone	111	70-130
Methyl tert-butyl ether	115	70-130
Hexane	144 Q	70-130
Ethyl Acetate	104	70-130
2-Butanone (Methyl Ethyl Ketone)	101	70-130
Chloroform	122	70-130
1,1,1-Trichloroethane	112	70-130
Cyclohexane	102	70-130
Carbon Tetrachloride	105	70-130
Benzene	113	70-130
1,2-Dichloroethane	96	70-130
Heptane	124	70-130
Trichloroethene	114	70-130
4-Methyl-2-pentanone	103	70-130
Toluene	96	70-130
Tetrachloroethene	117	70-130
Chlorobenzene	95	70-130
Ethyl Benzene	102	70-130
m,p-Xylene	111	70-130
o-Xylene	98	70-130
Styrene	69	20-100
Propylbenzene	124	70-130
1,4-Dichlorobenzene	100	50-110
Naphthalene	11	5-80

Q = Exceeds Quality Control limits.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: LCSD

Lab ID#: 1510016-09AA

**VOCS BY PASSIVE SAMPLER - GC/MS**

<b>File Name:</b>	<b>10100508sim</b>	<b>Date of Collection:</b> NA
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b> 10/5/15 11:33 AM
		<b>Date of Extraction:</b> 10/5/15

<b>Compound</b>	<b>%Recovery</b>	<b>Method Limits</b>
Ethanol	74	50-130
Acetone	107	70-130
Methyl tert-butyl ether	117	70-130
Hexane	146 Q	70-130
Ethyl Acetate	106	70-130
2-Butanone (Methyl Ethyl Ketone)	101	70-130
Chloroform	124	70-130
1,1,1-Trichloroethane	114	70-130
Cyclohexane	103	70-130
Carbon Tetrachloride	109	70-130
Benzene	118	70-130
1,2-Dichloroethane	98	70-130
Heptane	133 Q	70-130
Trichloroethene	115	70-130
4-Methyl-2-pentanone	104	70-130
Toluene	98	70-130
Tetrachloroethene	120	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	104	70-130
m,p-Xylene	116	70-130
o-Xylene	103	70-130
Styrene	72	20-100
Propylbenzene	130	70-130
1,4-Dichlorobenzene	104	50-110
Naphthalene	10	5-80

Q = Exceeds Quality Control limits.

**Container Type: Radiello 130 (Solvent)**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	104	70-130

**AUXIER & ASSOCIATES, INC.**

**Westlake Landfill**

**STANDARD LEVEL IV  
REPORT OF ANALYSIS**

**WORK ORDER #15-09112-OR**

**October 27, 2015**

**EBERLINE ANALYTICAL/OAK RIDGE LABORATORY  
OAK RIDGE, TN**

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**EBERLINE**  
SERVICES

## STANDARD OPERATING PROCEDURE

Sample Receiving

MP-001, Rev. 13  
Effective: 10/31/13  
Page 14 of 15

### Eberline Services – Oak Ridge Laboratory LABORATORY DATA SUPPORT CHECKLIST

MP-001-3

**15 - 09112**

Eberline Services Work Order #

The checklist items listed below are to be initialed by appropriate staff upon completion/verification.

Date for Partial	Initials	Date	Initials	Checklist Items
		9-16/15	JEB	Sample Log-In
		10/13/15	Jb	Data Compilation
		10/14/15	MLT	First Technical Data Review
		10/14/15	MQF	Second Technical Data Review
		10/27/15	EYT	Data Entry/Electronic Deliverable
		10/27/15	EYT	Case Narrative
		10/27/15	YBD	Electronic Deliverable Proof
		10/27/15	MSF	Samples Analyzed within Holding Time Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/>
		10/27/15	MSK	QA/QC Review
		10/13/15	EYT	Client in Possession of Data Electronic or Hard Copy
				Invoiced by Laboratory

Technical/Clerical Corrections, Signatures Needed, Problems, Etc	Date/Initials

Date package approved by:

Laboratory Manager

Date

Copy No. \_\_\_\_\_

Radiochemistry Services

: 00003

**SECTION I**  
**CHAIN OF CUSTODY**

# Chain of Custody Record

Nº 1604

Eberline Services  
601 Scarboro Road  
Oak Ridge, TN 37830  
(865) 481-0683 Phone • (865) 483-4621 Fax



Project Name:	Westlake Landfill	Project Number:						Comments, Special Instructions, etc.			Lab Sample ID (to be completed by lab)	
Send Report To:	EMSI / Auxier & Assoc.	Sampler (Print Name): <u>BILL ABERNATHY</u>										
Address:	Environmental Management Support, Inc. Lakewood CO 80225 Auxier & Associates, Inc. 9821 Coghill Road, Suite 1 Knoxville, TN 37932	Sampler (Print Name): <u>ALEX LUNA</u>										
Phone:	EMSI (303) 940-3422 / A & A (865) 675-3669	Shipment Method: FedEx										
Fax:	EMSI (303) 940-3422 / A & A (865) 675-3677	Airbill Number: <u>7745 3175 4014</u>										
Purchase Order #: <u>REC'D SEP 18 2015</u>												
Comments: Gross Alpha Analyses Requested												
Field Sample ID	3 Date	4 Sample Time	Sample Matrix	Number of Containers								
4 ENGWESEA001	9/16/15	1117	air filter	1	X	X						
5 ENGWESEA002			air filter	1	X	X						
6 ENGWESEA004	9/17/15	8446	air filter	1	X	X						
7 ENGWESEA005	9/16/15	902	air filter	1	X	X						
8 ENGWESEA006	9/16/15	1305	air filter	1	X	X						
9 ENGWESEA007	9/16/15	1140	air filter	1	X	X						
10 ENGWESEA008	9/16/15	1320	air filter	1	X	X						
11 ENGWESEA009	9/17/15	920	air filter	1	X	X						
12 ENGWESEA010	9/17/15	9446	air filter	1	X	X						
13 ENGWESEA011	9/16/15	13346	air filter	1	X	X						
14 ENGWESEA012	9/17/15	802	air filter	1	X	X						
15 ENGWESEA013	9/17/15	820	air filter	1	X	X						
16 Field Blank	9/16/15	1140	air filter	1	X	X						
17 ENGWESEA009 Field Dup	9/17/15	0920	u	u	u	u						
Relinquished by: (Signature)	Received by: (Signature)			Date:	7	Time:	8	Sample Custodian Remarks (Completed By Laboratory):				Sample Receipt
5 <u>M. H. M.</u>	6 FEDEX			Date:	9/17/15	Time:	11:30	GA/QC Level				Turnaround
Relinquished by: (Signature)	Received by: (Signature)			Date:	9/18/15	Time:	11:00	Level	I	<input checked="" type="checkbox"/> Routine	Total # Containers Received?	
Relinquished by: (Signature)	Received by: (Signature)			Date:	9/18/15	Time:	11:00	Level	II	<input type="checkbox"/> 24 Hour	COC Seals Present?	
Relinquished by: (Signature)	Received by: (Signature)			Date:	9/18/15	Time:	11:00	Level	III	<input type="checkbox"/> 1 Week	COC Seals Intact?	
								Other		<input type="checkbox"/> Other	Received Containers Intact?	
											Temperature?	

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epr  
10/2/15

# Chain of Custody Record

No 1604

Eberline Services  
601 Scarboro Road  
Oak Ridge, TN 37830  
(865) 481-0683 Phone • (865) 483-4621 Fax



							Page <u>1</u> of <u>1</u>	
Project Name:	Westlake Landfill						Project Number:	
Send Report To:	EMSI / Auxier & Assoc.						Sampler (Print Name): <u>BILL ABERNATHY</u> 1	
Address:	Environmental Management Support, Inc. 720 W. Jefferson Ave., Suite 406 Lakewood, CO 80225						Sampler (Print Name): <u>ALEX LIMA</u>	
Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37942							Shipment Method: FedEx	
Phone:	EMSI (303) 940-3426 / A & A (865) 675-3677						Airbill Number: <u>745 375 404</u> 2	
Fax:							Laboratory Receiving: Oak Ridge, TN 37830 (865) 481-0683	
							Purchase Order #:	
Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	Comments, Special Instructions, etc.			Lab Sample ID (to be completed by lab)
					Gross Alpha Analyses Requested			
ENGWES001	<u>9/16/15</u>	<u>1117</u>	air filter	1	X	X		<u>43,961,168,100 ml</u>
ENGWES002			air filter	1	X	X		
ENGWES003	<u>9/17/15</u>	<u>8446</u>	air filter	1	X	X		<u>44,921,449,000 ml</u>
ENGWES004	<u>9/17/15</u>	<u>902</u>	air filter	1	X	X		<u>46,749,471,400 ml</u>
ENGWES005	<u>9/16/15</u>	<u>1305</u>	air filter	1	X	X		<u>44,160,674,500 ml</u>
ENGWES006	<u>9/16/15</u>	<u>1440</u>	air filter	1	X	X		<u>45,712,451,800 ml</u>
ENGWES007	<u>9/16/15</u>	<u>1320</u>	air filter	1	X	X		<u>42,472,608,100 ml</u>
ENGWES008	<u>9/16/15</u>	<u>1250</u>	air filter	1	X	X		<u>44,699,954,600 ml</u>
ENGWES009	<u>9/17/15</u>	<u>920</u>	air filter	1	X	X		<u>49,164,714,300 ml</u>
ENGWES010	<u>9/17/15</u>	<u>946</u>	air filter	1	X	X		<u>46,140,036,200 ml</u>
ENGWES011	<u>9/16/15</u>	<u>1336</u>	air filter	1	X	X		<u>43,005,148,900 ml</u>
ENGWES012	<u>9/17/15</u>	<u>802</u>	air filter	1	X	X		<u>44,986,011,400 ml</u>
ENGWES013	<u>9/17/15</u>	<u>820</u>	air filter	1	X	X		<u>43,793,787,200 ml</u>
							Field Blank	
Relinquished by: (Signature) <u>5. null</u>	Received by: (Signature) <u>6. FedEx 745 375 404</u>			Date: <u>9/17/15</u>	Time: <u>1:30</u>	QA/QC Level: <u>IV</u>	Turnaround Time:	Sample Receipt
Relinquished by: (Signature) <u>6. null</u>	Received by: (Signature)			Date: <u></u>	Level: <u>I</u>	Level: <u>I</u>	Level: <u>II</u>	Total # Containers Received?
Relinquished by: (Signature) <u>6. null</u>	Received by: (Signature)			Date: <u></u>	Level: <u>II</u>	Level: <u>II</u>	Level: <u>II</u>	COC Seals Present?
Relinquished by: (Signature) <u>6. null</u>	Received by: (Signature)			Date: <u></u>	Level: <u>III</u>	Level: <u>III</u>	Level: <u>III</u>	COC Seals Intact?
					Other	Other	Other	Received Containers Intact? Temperature?

60000



**EBERLINE**  
SERVICES  
Oak Ridge Laboratory

# Internal Chain of Custody

Work Order #

15-09112

Lab Deadline

10/9/2015

Analysis

GaGbT\_ThSr - Level 4

Sample Matrix

Air Filter

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	36	S1.2
	05	33	S1.2
	06	37	S1.2
	07	38	S1.2
	08	34	S1.2
	09	36	S1.2
	10	43	S1.2
Lab to split Fraction 11 and run other half as Fraction 17 Field Dup.	11	34	S1.2
	12	39	S1.2
	13	34	S1.2
	14	41	S1.2
	15	32	S1.2
	16	34	S1.2
	17	0	S1.2

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	MH	7 OCT 15
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	MH	12 OCT 15 0930
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		10/12/0930
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		10/12/0930
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

**SECTION II**  
**SAMPLE ACKNOWLEDGEMENT**

Client Name		Contract/PO	Project Type	Date Received	Required Turnaround Days
Auxier & Associates, Inc.		WESTLAKE	Environmental	09/18/2015	28
Project Name		Client WO	Sample Disp	Lab Deadline	Internal Deadline
WESTLAKE		WESTLAKE LANDFILL	H	10/09/2015	10/15/2015
Internal ID	Client ID	Sample Date	Matrix	Storage	
01	LCS	09/18/15	AF	S1.2	X
02	BLANK	09/18/15	AF	S1.2	X
03	DUP	09/18/15	AF	S1.2	X
04	ENGWESA001	09/16/15 11:17	AF	S1..2	X
05	ENGWESA003	09/17/15 08:46	AF	S1..2	X
06	ENGWESA004	09/17/15 08:02	AF	S1..2	X
07	ENGWESA005	09/16/15 13:05	AF	S1..2	X
08	ENGWESA006	09/16/15 11:40	AF	S1..2	X
09	ENGWESA007	09/16/15 13:20	AF	S1..2	X
10	ENGWESA008	09/16/15 12:50	AF	S1..2	X
11	ENGWESA009	09/17/15 09:20	AF	S1..2	X
12	ENGWESA010	09/17/15 08:46	AF	S1..2	X
13	ENGWESA011	09/16/15 13:36	AF	S1..2	X
14	ENGWESA012	09/17/15 08:02	AF	S1..2	X
15	ENGWESA013	09/17/15 08:20	AF	S1..2	X
16	FIELD BLANK	09/16/15 11:40	AF	S1..2	X
17	ENGWESA009 FIELD DUP	09/17/15 08:20	AF	S1..2	X
Totals Per Analysis (non QA samples)					
14 0 0 0 0 0					

**EBERLINE**  
SERVICES

Sample Log In Report  
Voice: (865) 481-0683  
Fax: (865) 483-4621



Invoice	Accounts Payable	Report Data
Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830	Auxier & Associates, Inc. 9821 Cogdill Drive #1 Knoxville, TN 37932  Voice 865-675-3869 Fax 865-675-3877	Marsha Joseph Auxier & Associates, Inc. 9821 Cogdill Drive #1 Knoxville, TN 37932  Voice 865-675-3869 Fax 865-675-3877



## STANDARD OPERATING PROCEDURE

Sample Receiving

MP-001, Rev. 13  
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Eberline Services – Oak Ridge Laboratory

## SAMPLE RECEIPT CHECKLIST

MP-001-2

15-09112

WORK ORDER # \_\_\_\_\_

SAMPLE MATRIX/MATRICES:

(CIRCLE ONE OR BOTH)

AQUEOUS

NON-AQUEOUS

(CIRCLE EITHER YES, NO, OR N/A)

WERE SAMPLES:

Received in good condition?	<input checked="" type="checkbox"/>	N	
If aqueous, properly preserved	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>

WERE CHAIN OF CUSTODY SEALS:

Present on outside of package?	<input checked="" type="checkbox"/>	N
Unbroken on outside of package?	<input checked="" type="checkbox"/>	N
Present on samples?	<input checked="" type="checkbox"/>	N
Unbroken on samples?	<input checked="" type="checkbox"/>	N
Was chain of custody present upon sample receipt?	<input checked="" type="checkbox"/>	N

IF THE RESPONSE TO ANY OF THE ABOVE IS NO, A DISCREPANT SAMPLE RECEIPT REPORT (DSR) HAS BEEN ISSUED.

REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SIGNATURE:

DATE: 9-18-15

Copy No. \_\_\_\_\_

Radiochemistry Services

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**SECTION III**  
**CASE NARRATIVE**



EBERLINE ANALYTICAL CORPORATION  
601 SCARBORO ROAD  
OAK RIDGE, TENNESSEE 37830  
PHONE (865) 481-0683  
FAX (865) 483-4621

EBS-OR-39858

October 27, 2015

Marsha Joseph  
Auxier & Associates, Inc.  
9821 Cogdill Road #1  
Knoxville, TN 37932

CASE NARRATIVE  
Work Order # 15-09112-OR

SAMPLE RECEIPT

This work order contains thirteen air filter samples received 09/18/2015. These samples were analyzed for Gross Alpha/Beta.

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>CLIENT ID</u>	<u>LAB ID</u>
ENGWESA001	15-09112-04	ENGWESA009	15-09112-11
ENGWESA003	15-09112-05	ENGWESA010	15-09112-12
ENGWESA004	15-09112-06	ENGWESA011	15-09112-13
ENGWESA005	15-09112-07	ENGWESA012	15-09112-14
ENGWESA006	15-09112-08	ENGWESA013	15-09112-15
ENGWESA007	15-09112-09	FIELD BLANK	15-09112-16
ENGWESA008	15-09112-10	ENGWESA009 FIELD DUP	15-09112-17

ANALYTICAL METHODS

Gross Alpha/Beta was performed using Method LANL MLR-100 Modified.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 2-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

SPECIAL CIRCUMSTANCE

Per direction from the client, one of the samples was chosen at random and split for a field duplicate. Client ID ENGWESA009 was split and lab fraction -17 was designated as the field duplicate.

## ANALYTICAL RESULTS CONTINUED

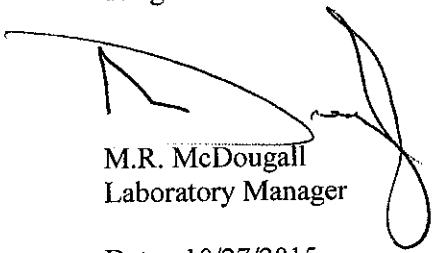
### GROSS ALPHA & BETA

Five cuts outs were made from each 8 X 10 filter. Each cut was attached directly to a stainless steel planchet and transferred to the counting room for activity determinations by gas-flow proportional counting. Results from the five cuts were summed and reported for each sample.

Samples demonstrated acceptable results for all Gross Alpha and Beta analyses. The Gross Alpha and Beta method blank demonstrated acceptable results. Results for the Gross Alpha and Beta replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Gross Alpha and Beta laboratory control sample demonstrated an acceptable percent recovery.

### CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

  
M.R. McDougall  
Laboratory Manager

Date: 10/27/2015

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit <http://www.eberlineservices.com/client.htm> to provide us with feedback on our services.

**SECTION IV**  
**ANALYTICAL RESULTS SUMMARY**

# Eberline Analytical

## Final Report of Analysis

**Marsha Joseph**  
**Auxier & Associates, Inc.**  
**9821 Cogdill Drive #1**  
**Knoxville, TN 37932**

Report To:										Work Order Details:					
SDG: 15-09112										Project: Westlake Landfill					
Analysis Category: ENVIRONMENTAL										Sample Matrix: AF					
Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	CV	Report Units	
15-09112-01	LCS	KNOWN	09/18/15 00:00	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	2.70E-04	1.16E-05	3.04E-05	1.66E-07	uCi/ml		
15-09112-01	LCS	SPIKE	09/18/15 00:00	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	2.88E-04	7.58E-06	3.23E-05	2.92E-17	2.88E-17	uCi/ml	
15-09112-02	MBL	BLANK	09/18/15 00:00	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	-8.34E-18	1.02E-17	1.02E-17	1.56E-17	1.79E-17	uCi/ml	
15-09112-03	DUP	ENGWESA001	09/16/15 11:17	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.20E-15	1.67E-16	5.92E-16	6.04E-16	4.31E-18	1.54E-17	uCi/ml
15-09112-04	DO	ENGWESA001	09/16/15 11:17	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.31E-15	1.71E-16	6.04E-16	2.04E-17	2.09E-17	uCi/ml	
15-09112-05	TRG	ENGWESA003	09/17/15 08:46	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	4.78E-15	1.62E-16	5.46E-16	6.48E-16	1.82E-17	2.54E-17	uCi/ml
15-09112-06	TRG	ENGWESA004	09/17/15 09:02	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	6.09E-15	1.80E-16	6.90E-16	1.54E-17	1.77E-17	uCi/ml	
15-09112-07	TRG	ENGWESA005	09/16/15 13:05	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.38E-15	1.74E-16	6.13E-16	3.33E-17	3.33E-17	uCi/ml	
15-09112-08	TRG	ENGWESA006	09/16/15 11:40	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.05E-15	1.67E-16	5.77E-16	1.58E-17	1.82E-17	uCi/ml	
15-09112-09	TRG	ENGWESA007	09/16/15 13:20	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.70E-15	1.82E-16	6.48E-16	2.57E-17	2.54E-17	uCi/ml	
15-09112-10	TRG	ENGWESA008	09/16/15 12:50	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.75E-15	1.79E-16	6.53E-16	3.50E-17	3.57E-17	uCi/ml	
15-09112-11	TRG	ENGWESA009	09/17/15 09:20	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	4.37E-15	1.48E-16	4.99E-16	1.87E-17	1.92E-17	uCi/ml	
15-09112-12	TRG	ENGWESA010	09/17/15 09:46	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	4.46E-15	1.54E-16	5.11E-16	3.14E-17	3.14E-17	uCi/ml	
15-09112-13	TRG	ENGWESA011	09/16/15 13:36	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	6.16E-15	1.95E-16	7.00E-16	2.72E-17	2.68E-17	uCi/ml	
15-09112-14	TRG	ENGWESA012	09/17/15 08:02	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.72E-15	1.79E-16	6.50E-16	3.28E-17	3.29E-17	uCi/ml	
15-09112-15	TRG	ENGWESA013	09/17/15 08:20	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	5.23E-15	1.74E-16	5.97E-16	2.55E-17	2.52E-17	uCi/ml	
15-09112-16	TRG	FIELD BLANK	09/16/15 11:40	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	3.77E-17	2.24E-17	2.28E-17	3.97E-17	4.29E-17	uCi/ml	
15-09112-17	TRG	ENGWESA009 FIELD DUP	09/17/15 09:20	9/18/2015	10/12/2015	15-09112	Gross Alpha	LANL MLR-100 Modified	4.26E-15	1.46E-16	4.87E-16	3.66E-17	3.95E-17	uCi/ml	

CU=Counting Uncertainty; CSU=Combined Standard Uncertainty (2-sigma); MDA=Minimal Detected Activity; LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original;  
 CV=Critical Value



**EBERLINE**  
SERVICES

EBERLINE ANALYTICAL CORPORATION  
601 SCARBORO ROAD OAK RIDGE, TN 37830

865/481-0683 FAX 865/483-4621

# Eberline Analytical

## Final Report of Analysis

**Marsha Joseph**  
**Auxier & Associates, Inc.**  
**9821 Cogdill Drive #1**  
**Knoxville, TN 37932**

Report To:										Work Order Details:				
SDG: <b>15-09112</b>										Project: Westlake Landfill				
Analysis Category: ENVIRONMENTAL										Sample Matrix: AF				
Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	CV	Report Units
15-09112-01	LCS	KNOWN	09/18/15 00:00	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	2.94E-04	8.82E-06				uCi/ml
15-09112-01	LCS	SPIKE	09/18/15 00:00	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	2.80E-04	6.30E-06	3.92E-05	9.39E-07	2.00E-06	uCi/ml
15-09112-02	MBL	BLANK	09/18/15 00:00	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	-5.93E-18	2.74E-17	5.96E-17	1.83E-16		uCi/ml
15-09112-03	DUP	ENGWESA001	09/18/15 11:17	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.24E-14	3.72E-16	5.87E-15	5.93E-17	1.83E-16	uCi/ml
15-09112-04	DO	ENGWESA001	09/18/15 11:17	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.45E-14	3.89E-16	6.16E-15	6.16E-15	7.10E-17	uCi/ml
15-09112-05	TRG	ENGWESA003	09/17/15 08:46	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.37E-14	3.84E-16	6.05E-15	6.05E-15	7.22E-17	uCi/ml
15-09112-06	TRG	ENGWESA004	09/17/15 09:02	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.77E-14	3.91E-16	6.60E-15	6.60E-15	7.30E-17	uCi/ml
15-09112-07	TRG	ENGWESA005	09/16/15 13:05	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.31E-14	3.79E-16	5.97E-15	5.97E-15	7.21E-17	uCi/ml
15-09112-08	TRG	ENGWESA006	09/16/15 11:40	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.43E-14	3.85E-16	6.13E-15	6.13E-15	6.95E-17	uCi/ml
15-09112-09	TRG	ENGWESA007	09/16/15 13:20	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.34E-14	3.90E-16	6.02E-15	6.02E-15	6.23E-17	uCi/ml
15-09112-10	TRG	ENGWESA008	09/16/15 12:50	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.63E-14	3.95E-16	6.41E-15	6.41E-15	5.48E-17	uCi/ml
15-09112-11	TRG	ENGWESA009	09/17/15 09:20	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.01E-14	3.58E-16	5.55E-15	5.55E-15	5.38E-17	uCi/ml
15-09112-12	TRG	ENGWESA010	09/17/15 09:46	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	3.80E-14	3.51E-16	5.26E-15	5.26E-15	6.90E-17	uCi/ml
15-09112-13	TRG	ENGWESA011	09/16/15 13:36	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.76E-14	4.11E-16	6.58E-15	6.58E-15	6.14E-17	uCi/ml
15-09112-14	TRG	ENGWESA012	09/17/15 08:02	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.46E-14	3.83E-16	6.17E-15	6.17E-15	7.00E-17	uCi/ml
15-09112-15	TRG	ENGWESA013	09/17/15 08:20	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	3.90E-14	3.64E-16	5.41E-15	5.41E-15	5.54E-17	uCi/ml
15-09112-16	TRG	FIELD BLANK	09/16/15 11:40	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	4.79E-16	4.83E-17	8.19E-17	8.19E-17	6.04E-17	uCi/ml
15-09112-17	TRG	ENGWESA009 FIELD DUP	09/17/15 09:20	9/18/2015	10/12/2015	15-09112	Gross Beta	LANL MLR-100 Modified	3.58E-14	3.28E-16	4.96E-15	5.12E-17	1.55E-16	uCi/ml

CU=Counting Uncertainty; CSU=Combined Standard Uncertainty (2-sigma); MDA=Minimal Detected Activity; LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original;  
 CV=Critical Value



**EBERLINE**  
SERVICES

EBERLINE ANALYTICAL CORPORATION  
601 SCARBORO ROAD OAK RIDGE, TN 37830

865/481-0683 FAX 865/483-4621

00015 A EGT  
10/27/15

**SECTION V**  
**ANALYTICAL STANDARD**

**ANALYTICS**



QA/QC REVIEWED	
Date	4/30/96 Initials <u>WT</u>

Am-4

1380 Seaboard Industrial Blvd.  
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677  
Fax (404) 352-2837

## CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

52094-416

Am-241 10 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	1.975 E+05
HALF-LIFE:	432.2 years
CALIBRATION DATE:	March 19, 1996 12:00 EST
TOTAL ERROR:	3.0%
SYSTEMATIC ERROR:	2.37%
RANDOM ERROR:	0.63%

10.01177 grams of solution 1M HCl.

P O NUMBER OR3830, Item 1

SOURCE PREPARED BY: Karen O'Brie Beverly

K. O. Beverly, Radiochemist

Q A APPROVED: D.M. Meltz

4-26-96

: 00017



## QUALITY CONTROL PROGRAM

MP-009

Rev.8; 1/10/03  
Title: Radioactive Reference Standards Solutions & Records

### EBERLINE SERVICES - OAK RIDGE LABORATORY RADIOACTIVE REFERENCE STANDARD SOLUTIONS SECONDARY DILUTION (RE-CERTIFICATION)

Solution Reference #	Analytics: 52094-416	Date	8/5/2015 0:00
Principal Radionuclide	Half Life, Years	Solution #	A/B-7 (alpha)
<sup>241</sup> Americium	4.322E+02	Half Life, Days	1.579E+05
Radionuclide of Interest	<sup>241</sup> Am	Reference Date	3/19/1996 0:00
Parent Solution Conc.	1.19E+04 dpm/ml		
<b>Chemical Composition of Standard Solution</b>			
<sup>241</sup> AmCl <sub>3</sub> in 1M HCl			
Dilution Instructions:	Dilution Solvent Used	1M HNO <sub>3</sub>	
<b>SECONDARY VOLUMETRIC DILUTION</b>			
Vol. Parent Solution:	60.0000 ml	Final Activity Concentration:	7.1100E+02 dpm/ml
Total Activity:	7.1100E+05 dpm		
Final Volume:	1000.00 ml	This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.	
NOTES:			
Expiration Date: August 4, 2016			
Verified & Approved By:			
QC Approval:			
Date:	8/5/15		
Date:	8/5/15		

Sr-76  
13 w.m.



# National Institute of Standards & Technology

## Certificate

### Standard Reference Material 4234A Strontium-90 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive strontium-90 chloride, non-radioactive strontium chloride, non-radioactive yttrium chloride, and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of beta-particle counting instruments and for the monitoring of radiochemical procedures.

#### Radiological Hazard

The SRM ampoule contains strontium-90 with a total activity of approximately 13 MBq. Strontium-90 decays by beta-particle emission to yttrium-90, which also decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. The beta particles emitted from strontium-90 and yttrium-90 produce bremsstrahlung photons with energies up to 2 MeV. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]\*. Appropriate shielding and/or distance should be used to minimize personnel exposure. The SRM should be used only by persons qualified to handle radioactive material.

#### Chemical Hazard

The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

#### Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least March 2005.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

#### Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group and D.B. Golas, Nuclear Energy Institute Research Associate.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899  
May 1995 (Text only revised November 1997)

Thomas E. Gills, Chief  
Standard Reference Materials Program

\*Notes and references are on pages 5 and 6.



## QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/98  
Title: Radioactive Reference Standards Solutions & Records

### EBERLINE SERVICES - OAK RIDGE LABORATORY RADIOACTIVE REFERENCE STANDARD SOLUTIONS SECONDARY DILUTION (RE-CERTIFICATION)

Solution Reference #	NIST 4234A	Date	8/5/2015 0:00
Principal Radionuclide	Half Life, Years	Solution #	A/B-7 (beta)
<sup>90</sup> Strontium	2.878E+01		1.051E+04
Radionuclide of Interest	<sup>90</sup> Sr	Reference Date	3/13/1995 0:00
Parent Solution Conc.	1.52E+06 dpm/ml	The beta activity of solution reflects the original <sup>90</sup> Strontium concentration and an equal concentration of <sup>89</sup> Yttrium.	
Chemical Composition of Standard Solution <sup>90</sup> SrCl <sub>2</sub> in 1 M HCl			
Dilution Instructions:	Dilution Solvent Used 1 M HNO <sub>3</sub>		
<b>SECONDARY VOLUMETRIC DILUTION</b>			
Vol. Parent Solution:	0.5000 ml	Final Activity Concentration:	7.5764E+02 dpm/ml
Total Activity:	7.5764E+05 dpm		
Final Volume:	1000.00 ml	This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.	
NOTES:	Expiration Date: August 4, 2016		
Verified & Approved By	Date: 08/05/15		
QC Approval	Date: 8/5/15		

**SECTION VI**  
**QUALITY CONTROL SAMPLE RESULTS SUMMARY**

: 00021

W/O	Analysis	Run	Activity Units		Aliquot Units	Client Name
			uCi	ml		
15-09112	GaGbt_ThSr	1				Auxier & Associates, Inc.

### Laboratory Control Sample

Analyte	LCS Measured	CSU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	CSU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
GROSS ALPHA_TH	106.60%	11.24%	100.00%	4.30%	2.70E-04	1.16E-05	2.88E-04	3.23E-05	A/B-07	5.96E+02	4.30E+00	1.00E+00
GROSS BETA_SR	95.11%	14.00%	100.00%	3.00%	2.94E-04	8.82E-06	2.80E-04	3.92E-05	A/B-07	6.50E+02	3.00E+00	1.00E+00

### Matrix Spike

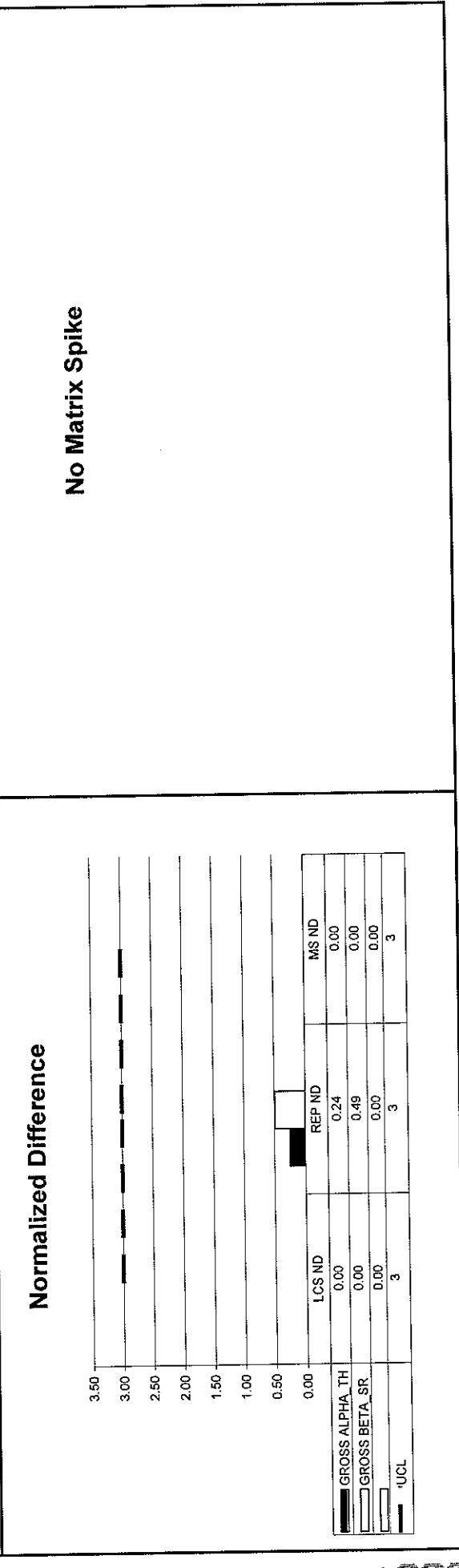
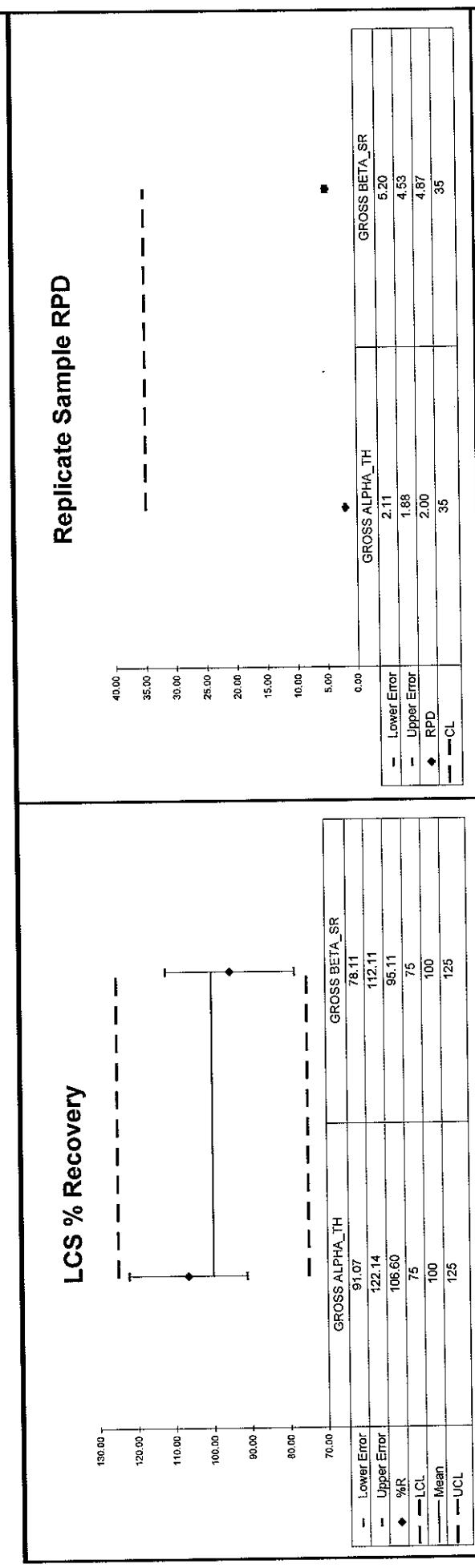
Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS CSU	Sample Result	Sample CSU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

### Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU	LCS Relative Bias	LCS % R	MS % R	MS ND	Rep RPD	Rep ND
GROSS ALPHA_TH	0.24	2.00	5.31E-15	6.04E-16	5.20E-15	5.92E-16	1.07	OK			OK	OK
GROSS BETA_SR	0.49	4.87	4.45E-14	6.16E-15	4.24E-14	5.87E-15	0.95	OK			OK	OK

00022

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
15-09112      GaGbT_ThSr		1	uCi	ml	Auxier & Associates, Inc.



**SECTION VII**

**LABORATORY TECHNICIAN'S NOTES  
& RUN LOGS**

: 00024

 <b>EBERLINE</b> SERVICES <b>Work Order Analysis Notes</b>	<b>Oak Ridge Laboratory</b> 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 <a href="http://www.eberlineservices.com">www.eberlineservices.com</a>	Internal Work Order	15-09112
		Analysis Code	GaGbT_ThSr
		Run Number	1

#	Date	Dept	User	Notes
1	10/12/15 09:24	PREP	MHIGHTOWER	Prepared spike and blank, affixed samples to planchets, and submitted to count room

Mh 12 OCT15



**EBERLINE**  
SERVICES

Reagents Used in an Analysis

Internal Work Order

**15-09112**

Analysis Code

Run

**GaGbT\_ThSr**

**1**

Reagent ID	Reagent Name	Reagent Concentration	Analyst ID	Date Recorded
016403D12	Nitric Acid	3N	MHIGHTOWER	10/12/2015

CBY110 KED

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Date	Project	Client	Duration	C/Pin	Mileage	Rate
10/19	GFFac	UAB	0507	7	1d	\$
10/19	Phaseac	UAB	0547	6	1d	-
10/19	150048ADU-4)	UCON	0718	2L	dB	-
10/19	15091048(2-5)	UCON	0722	2L	SIGOLY	-
10/19	150810484(11)	UCON	0722	7L	SIGOLY	-
10/19	150814844(11)	UST	0921	7L	R48	-
10/19	150814844(2-5)	UST	0921	2L	R48	-
10/19	150814844(1-4)	Accent	0921	2L	R48	-
10/11/10	Weekly Diesel	Lab	1004	12 hr	2P	KBS
10/12	GFFac	UAB	0506	7	1d	\$
10/12	Phaseac	UAB	0538	6	1d	-
10/12	150912834(2-5)	UCON	0858	2L	SIGOLY	-
10/12	150812834(11)	UCON	0858	7L	SIGOLY	-
10/12/10	150820RA(1-4)	UCON	1114	2hr	Rat	KBS
10/12/10	1509109RA(1-4)	Accentest	1117	2hr	Rat	KBS
10/12/10	1509121RA(2-5)	Accentest	1118	2hr	Rat	KBS
10/12/10	1509112ABGe-9A)	Auscar	1207	2hr	2P	KBS
10/12/10	1509112ABG(1c-13d)	Auscar	1527	2hr	2P	KBS
10/13	GFFac	UAB	0505	7	1d	\$
10/13	OKAAC	UAB	0528	6	1d	-
10/13	1509117AB2(44-12,13-17,12)	Phaser	0717	2L	1d	-

(B4110 RED)

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Date	Applift	Client	Buildin	Offim.	helped	Tech
10/19	EFFoE	UAB	0507	✓	1A	S
10/19	Biosac	UAB	0547	✓	1A	C
10/19	150048ADU-4)	UCON	0718	✓	dA8	C
10/19	15091048H(2-5)	UCON	0722	✓	SGEO14	C
10/19	1508104541C11)	UCON	0722	✓	SGEO14	C
10/19	1509148R4L11)	UST	0971	✓	148	C
10/19	1508148A4L2-5)	UST	0971	✓	148	C
10/19	1509148141-4)	Accent	0971	✓	148	C
10/11/16	Weekly Blcsel	Lab	1004	12 hr	xp	KB
10/12	EFFoE	UAB	0506	✓	1B	S
10/12	Biosac	UAB	0538	✓	1B	C
10/12	150912834(2-5)	UCON	0858	✓	SGEO14	S
10/12	150812834L1)	UCON	0858	✓	SGEO14	S
10/12/16	150912020A(1-4)	UCON	1114	2 hr	1a8	KB
10/12/16	1509109RA(1-4)	Accutest	1117	2 hr	1a8	KB
10/12/16	1509121RA(2-5)	Accutest	1118	2 hr	1a8	KB
10/12/16	1509112AB(6c-9A)	Austin	1527	2 hr	xp	KB
10/12/16	1509112AB1(1c-13d)	Austin	1527	2 hr	xp	KB

LB4110 Area

63

Date	Sample#	Client	Location	CT Line	Sample Test
10/18	1510020SRG(4)	UCON	0928	2hr	SNT01
10/18	150912RAU(4)	STOFND	0930	2hr	R48
10/18	1510020SRG(4)	Taylor	0931	2hr	L13
10/18/15	1510020Pb(1-4)	UCON	1414	2hrs	Pb200
10/18/15	1509124Pb(2-4)	UCON	1419	2hrs	Pb200
10/18/15	1509124Pb(1)	UCON	1419	30mins	Pb210
10/19	Biospac	Lab	0507	6hr	L13
10/19	GF700	Lab	0615	7hr	L13
10/19	150915TAP(4)	UCON	0828	1hr	NP202
10/19	1510020NPL(4)	UCON	0828	1hr	NP202
10/19	1509142R4U(1)	Texas	0835	6hr	R48
10/19	1509142R4U(2)	Texas	0835	7hr	R48
10/11/15	Weekly Blends	Lab	1006	12 hrs	2B
10/12	Biospac	Lab	0506	6hr	L13
10/12	GF700	Lab	0614	7hr	L13
10/12	1509112ABCA(264A-10) Auxier	Auxier	1022	2hr	1B
10/12	150912RAU(1)	Auxier	1024	7hr	1B
10/12/15	150912RAU(1)	Acenstest	1118	1 hr	Raw
10/12/15	1509112AB2(41-6d)	Auxier	1225	2 hrs	2B
10/12/15	1509112AB3(9b-11b)	Auxier	1430	2 hrs	2B
10/12/15	1509112AB4(13e-15e)	Auxier	1433	2 hrs	2B

**SECTION VIII**  
**ANALYTICAL DATA (GROSS ALPHA/BETA)**

: 00030

**15-09112**  
**GaGbT\_ThSr**  
Run 1

Work Order	15-09112
Analysis Code	<b>GaGbT_ThSr</b>
Run	<b>1</b>
Date Received	<b>9/18/2015</b>
Lab Deadline	<b>10/9/2015</b>
Client	Auxier & Associates, Inc.
Project	WESTLAKE
Report Level	<b>4</b>
Activity Units	uCi
Aliquot Units	mL
Matrix	AF
Method	LANL MLR-100 Modified
Instrument Type	Alpha/Beta GPC
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		09/18/15 00:00	1.0000E+00
02	MBL	BLANK		09/18/15 00:00	9.1000E+09
03	DUP	ENGWESA001	36	09/16/15 11:17	9.0100E+09
04	DO	ENGWESA001	36	09/16/15 11:17	9.0100E+09
05	TRG	ENGWESA003	33	09/17/15 08:46	9.2100E+09
06	TRG	ENGWESA004	37	09/17/15 09:02	9.5800E+09
07	TRG	ENGWESA005	38	09/16/15 13:05	9.0500E+09
08	TRG	ENGWESA006	34	09/16/15 11:40	9.3700E+09
09	TRG	ENGWESA007	36	09/16/15 13:20	8.7100E+09
10	TRG	ENGWESA008	43	09/16/15 12:50	9.1600E+09
11	TRG	ENGWESA009	34	09/17/15 09:20	1.0100E+10
12	TRG	ENGWESA010	39	09/17/15 09:46	9.4600E+09
13	TRG	ENGWESA011	34	09/16/15 13:36	8.8200E+09
14	TRG	ENGWESA012	41	09/17/15 08:02	9.2200E+09
15	TRG	ENGWESA013	32	09/17/15 08:20	8.9800E+09
16	TRG	FIELD BLANK	34	09/16/15 11:40	9.2200E+09
17	TRG	ENGWESA009 FIELD DUP		09/17/15 09:20	1.0100E+10

\* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.  
\*\* Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Net (g)	Mean % Rec	SAF 1*	SAF 2*
01	LCS			0.00		7.5683	7.5685	0.0002			1.00	1.00
02	MBL			0.00		7.5942	7.5946	0.0004			1.00	1.00
03	DUP			0.00		1.0000	1.0001	0.0001			1.00	1.00
04	DO			0.00		1.0000	1.0001	0.0001			1.00	1.00
05	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
06	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
07	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
08	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
09	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
10	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
11	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
12	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
13	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
14	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
15	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
16	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00
17	TRG			0.00		1.0000	1.0001	0.0001			1.00	1.00

\* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.

\*\* Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

00632

**15-09112**  
**GaGbT\_ThSr**  
Run 1

Printed: 10/12/2015 9:32 AM  
Page 3 of 3

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep to Date/Time	Sep to By	Sep to Date/Time	Sep to By
01	LCS			10/07/15 04:38	MHIGHTOWER				
02	MBL			10/07/15 04:38	MHIGHTOWER				
03	DUP			10/07/15 04:38	MHIGHTOWER				
04	DO			10/07/15 04:38	MHIGHTOWER				
05	TRG			10/07/15 04:38	MHIGHTOWER				
06	TRG			10/07/15 04:38	MHIGHTOWER				
07	TRG			10/07/15 04:38	MHIGHTOWER				
08	TRG			10/07/15 04:38	MHIGHTOWER				
09	TRG			10/07/15 04:38	MHIGHTOWER				
10	TRG			10/07/15 04:38	MHIGHTOWER				
11	TRG			10/07/15 04:38	MHIGHTOWER				
12	TRG			10/07/15 04:38	MHIGHTOWER				
13	TRG			10/07/15 04:38	MHIGHTOWER				
14	TRG			10/07/15 04:38	MHIGHTOWER				
15	TRG			10/07/15 04:38	MHIGHTOWER				
16	TRG			10/07/15 04:38	MHIGHTOWER				
17	TRG			10/07/15 04:38	MHIGHTOWER				

\* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.

\*\* Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

	Auxier & Associates, Inc.
Client	Eberline Services Work Order
Analysts Code	Run
GAGBT	15-09112
1	

Preliminary Data Report & Analytical Calculations  
**Work Order: 15-09112-GaGbT-1**

Client	EBERLINE SERVICES WORK ORDER	ANALYSIS CODE	Eberline Services Work Order	Auxier & Associates, Inc.
CE0999	15-09112	GaGbT	1	CE0999

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t1 Date/Time	Sep t1 Date/Time
01	GROSS ALPHA	LCS	09/18/15 00:00	1.00E+00	0.00	0.00	0.00	1.00		
02	GROSS ALPHA	MBL	09/18/15 00:00	9.10E+09	0.00	0.00	0.00	1.00		
03	GROSS ALPHA	DUP	09/16/15 11:17	9.01E+09	0.00	0.00	0.00	1.00		
04	GROSS ALPHA	DO	09/16/15 11:17	9.01E+09	0.00	0.00	0.00	1.00		
05	GROSS ALPHA	TRG	09/17/15 08:46	9.21E+09	0.00	0.00	0.00	1.00		
06	GROSS ALPHA	TRG	09/17/15 09:02	9.58E+09	0.00	0.00	0.00	1.00		
07	GROSS ALPHA	TRG	09/16/15 13:05	9.05E+09	0.00	0.00	0.00	1.00		
08	GROSS ALPHA	TRG	09/16/15 11:40	9.37E+09	0.00	0.00	0.00	1.00		
09	GROSS ALPHA	TRG	09/16/15 13:20	8.71E+09	0.00	0.00	0.00	1.00		
10	GROSS ALPHA	TRG	09/16/15 12:50	9.16E+09	0.00	0.00	0.00	1.00		
11	GROSS ALPHA	TRG	09/17/15 09:20	1.01E+10	0.00	0.00	0.00	1.00		
12	GROSS ALPHA	TRG	09/17/15 09:46	9.46E+09	0.00	0.00	0.00	1.00		
13	GROSS ALPHA	TRG	09/16/15 13:36	8.82E+09	0.00	0.00	0.00	1.00		
14	GROSS ALPHA	TRG	09/17/15 08:02	9.22E+09	0.00	0.00	0.00	1.00		
15	GROSS ALPHA	TRG	09/17/15 08:20	8.98E+09	0.00	0.00	0.00	1.00		
16	GROSS ALPHA	TRG	09/16/15 11:40	9.22E+09	0.00	0.00	0.00	1.00		
17	GROSS ALPHA	TRG	09/17/15 09:20	1.01E+10	0.00	0.00	0.00	1.00		

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	GROSS ALPHA	LGS	10/12/15 16:58		LB4110R	A1	30	5525	0.0166666667	0.2885
02	GROSS ALPHA	MBL	10/12/15 15:28		LB4110R	A2	120	4	0.0833333333	0.2968
03	GROSS ALPHA	DUP	10/12/15 12:26		LB4110A	A1	120	3719	0.0166666667	0.2976
04	GROSS ALPHA	DO	10/12/15 12:26		LB4110A	A2	120	3699	0	0.2903
05	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	A3	120	3371	0.0333333333	0.2872
06	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	B1	120	4389	0.0166666667	0.2821
07	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	B2	120	3690	0.1	0.2835
08	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	B3	120	3539	0.0166666667	0.2804
09	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	B4	120	3763	0.05	0.2843
10	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	C1	120	4008	0.1166666667	0.2845
11	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	C2	120	3382	0.0333333333	0.2857
12	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	C3	120	3250	0.1	0.2878
13	GROSS ALPHA	TRG	10/12/15 12:26		LB4110A	C4	120	3350	0.05	0.2657
14	GROSS ALPHA	TRG	10/12/15 15:28		LB4110R	B1	120	3572	0.1	0.2819
15	GROSS ALPHA	TRG	10/12/15 15:28		LB4110R	B2	120	3480	0.05	0.2778
16	GROSS ALPHA	TRG	10/12/15 15:28		LB4110R	B3	120	47	0.1666666667	0.2919
17	GROSS ALPHA	TRG	10/12/15 15:28		LB4110R	B4	120	3336	0.1666666667	0.2895

	Client	EBERLINE SERVICES Work Order	Analytical Code	Run	Auxier & Associates, Inc.
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10

GaGBT

15-09112

es, Inc.

Edgar

Client

• 00003

Eberline Services  
Oak Ridge LaboratoryPreliminary Data Report & Analytical Calculations  
**Work Order: 15-09112-GaGbT-1**Printed: 10/13/2015 12:58 PM  
Page 2 of 3

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep 10 Date/Time	Sep 11 Date/Time
01	GROSS BETA	LCS	09/18/15 00:00	1.00E+00	0.00	0.00	0.00	1.00		
02	GROSS BETA	MBL	09/18/15 00:00	9.10E+09	0.00	0.00	0.00	1.00		
03	GROSS BETA	DUP	09/18/15 11:17	9.01E+09	0.00	0.00	0.00	1.00		
04	GROSS BETA	DO	09/16/15 11:17	9.01E+09	0.00	0.00	0.00	1.00		
05	GROSS BETA	TRG	09/17/15 08:46	9.21E+09	0.00	0.00	0.00	1.00		
06	GROSS BETA	TRG	09/17/15 09:02	9.58E+09	0.00	0.00	0.00	1.00		
07	GROSS BETA	TRG	09/16/15 13:05	9.05E+09	0.00	0.00	0.00	1.00		
08	GROSS BETA	TRG	09/16/15 11:40	9.37E+09	0.00	0.00	0.00	1.00		
09	GROSS BETA	TRG	09/16/15 13:20	8.71E+09	0.00	0.00	0.00	1.00		
10	GROSS BETA	TRG	09/16/15 12:50	9.16E+09	0.00	0.00	0.00	1.00		
11	GROSS BETA	TRG	09/17/15 09:20	1.01E+10	0.00	0.00	0.00	1.00		
12	GROSS BETA	TRG	09/17/15 09:46	9.46E+09	0.00	0.00	0.00	1.00		
13	GROSS BETA	TRG	09/16/15 13:36	8.82E+09	0.00	0.00	0.00	1.00		
14	GROSS BETA	TRG	09/17/15 08:02	9.22E+09	0.00	0.00	0.00	1.00		
15	GROSS BETA	TRG	09/17/15 08:20	8.98E+09	0.00	0.00	0.00	1.00		
16	GROSS BETA	TRG	09/16/15 11:40	9.22E+09	0.00	0.00	0.00	1.00		
17	GROSS BETA	TRG	09/17/15 09:20	1.01E+10	0.00	0.00	0.00	1.00		

Client	Eberline Services Work Order	Analysis Code	15-09112 GAGbT	Auxier & Associates, Inc.
				

					<b>15-09112</b>	<b>GaGbT</b>	<b>Auxier &amp; Associates, Inc.</b>	
					Client	Eberline Services Work Order	Analysis Code	Run

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff	A to B, Ctr
01	GROSS BETA	LCS	10/12/15 16:58		LB4110R	A1	30	10420	1.483333333	0.4777	298.124
02	GROSS BETA	MBL	10/12/15 15:28		LB4110R	A2	120	133	1.166666667	0.4871	1.108333333
03	GROSS BETA	DUP	10/12/15 12:26		LB4110A	A1	120	52154	1.2	0.5019	426.7633783
04	GROSS BETA	DO	10/12/15 12:26		LB4110A	A2	120	52780	1.616666667	0.4835	432.0222783
05	GROSS BETA	TRG	10/12/15 12:26		LB4110A	A3	120	52137	1.7	0.4765	427.3565717
06	GROSS BETA	TRG	10/12/15 12:26		LB4110A	B1	120	59983	1.933333333	0.4817	490.5902283
07	GROSS BETA	TRG	10/12/15 12:26		LB4110A	B2	120	52087	1.733333333	0.4903	426.2662833
08	GROSS BETA	TRG	10/12/15 12:26		LB4110A	B3	120	53042	1.583333333	0.4703	434.5434783
09	GROSS BETA	TRG	10/12/15 12:26		LB4110A	B4	120	49883	1.15	0.484	407.745465
10	GROSS BETA	TRG	10/12/15 12:26		LB4110A	C1	120	55055	0.95	0.4775	450.3281057
11	GROSS BETA	TRG	10/12/15 12:26		LB4110A	C2	120	50064	1.016666667	0.4555	410.1005767
12	GROSS BETA	TRG	10/12/15 12:26		LB4110A	C3	120	47009	1.666666667	0.4803	384.87875
13	GROSS BETA	TRG	10/12/15 12:26		LB4110A	C4	120	53762	1.083333333	0.4713	439.88675
14	GROSS BETA	TRG	10/12/15 15:28		LB4110R	B1	120	54724	1.683333333	0.4886	447.5696633
15	GROSS BETA	TRG	10/12/15 15:28		LB4110R	B2	120	46396	0.966666667	0.486	379.2180333
16	GROSS BETA	TRG	10/12/15 15:28		LB4110R	B3	120	750	1.283333333	0.4965	6.149850833
17	GROSS BETA	TRG	10/12/15 15:28		LB4110R	B4	120	47799	1.05	0.4853	391.21654

**Count Room Report**  
**Client: Auxier Associates, Inc.**

**15-09112-GaGbT\_ThSr-1 (uCi/ml) in AF**  
**Tracer ID:**

Printed: 10/12/2015 9:32 AM  
Page 1 of 1

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	09/18/15 00:00	1.0000				0.00	1.00	1.00
02	MBL	BLANK	09/18/15 00:00	910000000.0000				0.00	1.00	1.00
03	DUP	ENGWESA001	09/16/15 11:17	9010000000.0000				0.00	1.00	1.00
04	DO	ENGWESA001	09/16/15 11:17	9010000000.0000				0.00	1.00	1.00
05	TRG	ENGWESA003	09/17/15 08:46	9210000000.0000				0.00	1.00	1.00
06	TRG	ENGWESA004	09/17/15 09:02	9580000000.0000				0.00	1.00	1.00
07	TRG	ENGWESA005	09/16/15 13:05	9850000000.0000				0.00	1.00	1.00
08	TRG	ENGWESA006	09/16/15 11:40	9370000000.0000				0.00	1.00	1.00
09	TRG	ENGWESA007	09/16/15 13:20	8710000000.0000				0.00	1.00	1.00
10	TRG	ENGWESA008	09/16/15 12:50	9160000000.0000				0.00	1.00	1.00
11	TRG	ENGWESA009	09/17/15 09:20	10100000000.0000				0.00	1.00	1.00
12	TRG	ENGWESA010	09/17/15 09:46	9460000000.0000				0.00	1.00	1.00
13	TRG	ENGWESA011	09/16/15 13:36	8820000000.0000				0.00	1.00	1.00
14	TRG	ENGWESA012	09/17/15 08:02	9220000000.0000				0.00	1.00	1.00
15	TRG	ENGWESA013	09/17/15 08:20	8980000000.0000				0.00	1.00	1.00
16	TRG	FIELD BLANK	09/16/15 11:40	9220000000.0000				0.00	1.00	1.00
17	TRG	ENGWESA009 FIELD DUP	09/17/15 09:20	10100000000.0000				0.00	1.00	1.00



## Aliquot Worksheet

Work Order		Run	Analysis Code	Rpt Units	Lab Deadline	Technician			
15-09112		1	GaGbT_ThSr	ml	10/9/2015	MIGHTOWER			
Auxier & Associates, Inc.		Sample	Muffle Data			Dilution Data		Aliquot Data	MS Aliquot Data
Lab Fraction	Client ID	Type	Ratio Post/Pre	No of Dil's	Dil Factor	Ratio	Aliquot	Net Equiv	Water Added (ml)
01	LCS	LCS					1.0000E+00	1.0000E+00	
02	BLANK	MBL					9.1000E+09	9.1000E-09	
03	ENGWESA001	DUP					9.0100E+09	9.0100E-09	
04	ENGWESA001	DO					9.0100E+09	9.0100E-09	
05	ENGWESA003	TRG					9.2100E+09	9.2100E-09	
06	ENGWESA004	TRG					9.5300E+09	9.5800E-09	
07	ENGWESA005	TRG					9.0500E+09	9.0500E-09	
08	ENGWESA006	TRG					9.3700E+09	9.3700E-09	
09	ENGWESA007	TRG					8.7100E+09	8.7100E-09	
10	ENGWESA008	TRG					9.1600E+09	9.1600E-09	
11	ENGWESA009	TRG					1.0100E+10	1.0100E+10	
12	ENGWESA010	TRG					9.4600E+09	9.4600E-09	
13	ENGWESA011	TRG					8.8200E+09	8.8200E-09	
14	ENGWESA012	TRG					9.2200E+09	9.2200E-09	
15	ENGWESA013	TRG					8.9800E+09	8.9800E-09	
16	FIELD BLANK	TRG					9.2200E+09	9.2200E-09	
17	ENGWESA009 FIELD DUP	TRG					1.0100E+10	1.0100E+10	

Comments

Comments
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Technician: \_\_\_\_\_ Date: 10/12/15

## Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
15-09112	1	GaGbT_ThSr			MHIGHTOWER

Tratec Fraction	Auxier & Associates, Inc.	Sample Client ID	Carrier Data		Filter Data		Gravimetric	
			Type	Carrier Added (ml)	Filter Tare (g)	Filter Final (g)	Filter Net (g)	% Recovery
01	LCS	LCS	MBL	7.5683	7.5685	7.5946	0.0002	0.0004
02	BLANK		DUP		1.0000	1.0001	0.0001	0.0001
03	DUP		DO		1.0000	1.0001	0.0001	0.0001
04	ENGWESA001		TRG		1.0000	1.0001	0.0001	0.0001
05	ENGWESA003		TRG		1.0000	1.0001	0.0001	0.0001
06	ENGWESA004		TRG		1.0000	1.0001	0.0001	0.0001
07	ENGWESA005		TRG		1.0000	1.0001	0.0001	0.0001
08	ENGWESA006		TRG		1.0000	1.0001	0.0001	0.0001
09	ENGWESA007		TRG		1.0000	1.0001	0.0001	0.0001
10	ENGWESA008		TRG		1.0000	1.0001	0.0001	0.0001
11	ENGWESA009		TRG		1.0000	1.0001	0.0001	0.0001
12	ENGWESA010		TRG		1.0000	1.0001	0.0001	0.0001
13	ENGWESA011		TRG		1.0000	1.0001	0.0001	0.0001
14	ENGWESA012		TRG		1.0000	1.0001	0.0001	0.0001
15	ENGWESA013		TRG		1.0000	1.0001	0.0001	0.0001
16	FIELD BLANK		TRG		1.0000	1.0001	0.0001	0.0001
17	ENGWESA009 FIELD DUP		TRG		1.0000	1.0001	0.0001	0.0001

Technician: MH Date: 10/12/15

: 202040

AG  
10/13/15  
(R)

Detector ID	Sample ID	Alpha	Beta	Count	Time	Voltage	TOD
B1	1509112-14	3972	54724	120	1400	1400	10/12/15 17:28
B2	1509112-15	3480	46396	120	1400	1400	10/12/15 17:28
B3	1509112-16	47	750	120	1400	1400	10/12/15 17:28
B4	1509112-17	3336	47799	120	1400	1400	10/12/15 17:28
A1	1509112-01	5525	10420	30	1400	1400	10/12/15 17:28
A2	1509112-02	4	133	120	1400	1400	10/12/15 17:28

AC  
10/13/15  
CH

Detector ID	Sample ID	Alpha	Beta	Count	Time	Voltage	TOD
A1	1509112-03	3719	52154	120	1400	10/12/15 14:26	
A2	1509112-04	3699	52780	120	1400	10/12/15 14:26	
A3	1509112-05	3371	52137	120	1400	10/12/15 14:26	
B1	1509112-06	4389	59983	120	1400	10/12/15 14:26	
B2	1509112-07	3690	52087	120	1400	10/12/15 14:26	
B3	1509112-08	3539	53042	120	1400	10/12/15 14:26	
B4	1509112-09	3763	49883	120	1400	10/12/15 14:26	
C1	1509112-10	4008	55055	120	1400	10/12/15 14:26	
C2	1509112-11	3362	50064	120	1400	10/12/15 14:26	
C3	1509112-12	3250	47009	120	1400	10/12/15 14:26	
C4	1509112-13	3850	53762	120	1400	10/12/15 14:26	

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	10/12/2015	1.67E-02	P	-1.83E+01	2.24E-01	1.88E+01
LB4110A - A2	Alpha	11/18/2007	10/12/2015	0.00E+00	P	-1.55E+01	2.01E-01	1.59E+01
LB4110A - A3	Alpha	11/18/2007	10/12/2015	3.33E-02	P	-1.51E+01	1.78E-01	1.55E+01
LB4110A - A4	Alpha	11/18/2007	10/12/2015	5.00E-02	P	-1.61E+01	1.86E-01	1.64E+01
LB4110A - B1	Alpha	11/18/2007	10/12/2015	1.67E-02	P	-8.71E-02	7.19E-02	2.31E-01
LB4110A - B2	Alpha	11/18/2007	10/12/2015	1.00E-01	P	-6.91E-02	7.56E-02	2.20E-01
LB4110A - B3	Alpha	11/18/2007	10/12/2015	1.67E-02	P	-6.23E-02	5.68E-02	1.76E-01
LB4110A - B4	Alpha	11/18/2007	10/12/2015	5.00E-02	P	-1.22E-01	7.66E-02	2.75E-01
LB4110A - C1	Alpha	11/18/2007	10/12/2015	1.17E-01	P	-1.30E-01	8.71E-02	3.04E-01
LB4110A - C2	Alpha	11/18/2007	10/12/2015	3.33E-02	P	-1.58E-01	7.82E-02	3.14E-01
LB4110A - C3	Alpha	11/18/2007	10/12/2015	1.00E-01	P	-1.56E-01	8.97E-02	3.36E-01
LB4110A - C4	Alpha	11/18/2007	10/12/2015	5.00E-02	P	-6.46E-02	6.97E-02	2.04E-01
LB4110A - D1	Alpha	11/18/2007	10/12/2015	3.33E-02	P	-5.35E-02	7.77E-02	2.09E-01
LB4110A - D2	Alpha	11/18/2007	10/12/2015	0.00E+00	P	-6.60E-02	5.96E-02	1.85E-01
LB4110A - D3	Alpha	11/18/2007	10/12/2015	5.00E-02	P	-5.25E-02	6.37E-02	1.80E-01
LB4110A - D4	Alpha	11/18/2007	10/12/2015	6.67E-02	P	-6.41E-02	6.81E-02	2.00E-01
LB4110R - A1	Alpha	11/24/2006	10/12/2015	1.67E-02	P	-9.12E-02	9.48E-02	2.81E-01
LB4110R - A2	Alpha	11/24/2006	10/12/2015	8.33E-02	P	-8.23E-02	7.05E-02	2.23E-01
LB4110R - A3	Alpha	11/24/2006	10/12/2015	3.33E-02	P	-6.74E-02	8.17E-02	2.31E-01
LB4110R - A4	Alpha	11/24/2006	10/12/2015	1.00E-01	P	-5.07E-02	6.89E-02	1.88E-01
LB4110R - B1	Alpha	11/24/2006	10/12/2015	1.00E-01	P	-8.54E-02	6.22E-02	2.10E-01
LB4110R - B2	Alpha	11/24/2006	10/12/2015	5.00E-02	P	-2.81E+01	3.29E-01	2.88E+01
LB4110R - B3	Alpha	11/24/2006	10/12/2015	1.67E-01	P	-6.34E-02	7.20E-02	2.07E-01
LB4110R - B4	Alpha	11/24/2006	10/12/2015	1.67E-01	P	-5.91E-02	6.75E-02	1.94E-01
LB4110R - C1	Alpha	11/24/2006	10/12/2015	8.33E-02	P	-7.25E-02	7.19E-02	2.16E-01
LB4110R - C2	Alpha	11/24/2006	10/12/2015	5.00E-02	P	-7.39E-02	6.63E-02	2.07E-01
LB4110R - C3	Alpha	11/24/2006	10/12/2015	6.67E-02	P	-7.88E-02	8.38E-02	2.46E-01
LB4110R - C4	Alpha	11/24/2006	10/12/2015	5.00E-02	P	-5.86E-02	7.67E-02	2.12E-01
LB4110R - D1	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-1.06E-01	6.70E-02	2.40E-01
LB4110R - D2	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-8.23E-02	6.65E-02	2.15E-01
LB4110R - D3	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-8.71E-02	6.63E-02	2.20E-01
LB4110R - D4	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-8.04E-02	7.08E-02	2.22E-01
LB5100 - 1	Alpha	7/10/2006	10/26/2007	5.00E-02	P	-1.56E-02	9.58E-02	2.07E-01

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Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCI
LB4110A - A1	Beta	11/18/2007	10/12/2015	1.20E+00	P	-2.48E+02	6.46E+00	2.61E+02
LB4110A - A2	Beta	11/18/2007	10/12/2015	1.62E+00	P	-2.59E+01	2.57E+00	3.10E+01
LB4110A - A3	Beta	11/18/2007	10/12/2015	1.70E+00	P	-4.29E+01	2.47E+00	4.79E+01
LB4110A - A4	Beta	11/18/2007	10/12/2015	5.97E+00	F	-2.70E+01	4.16E+00	3.53E+01
LB4110A - B1	Beta	11/18/2007	10/12/2015	1.93E+00	P	-8.92E+00	2.87E+00	1.47E+01
LB4110A - B2	Beta	11/18/2007	10/12/2015	1.73E+00	P	-6.41E+00	1.87E+00	1.01E+01
LB4110A - B3	Beta	11/18/2007	10/12/2015	1.58E+00	P	-2.85E-01	1.41E+00	3.11E+00
LB4110A - B4	Beta	11/18/2007	10/12/2015	1.15E+00	P	-6.38E+00	1.87E+00	1.01E+01
LB4110A - C1	Beta	11/18/2007	10/12/2015	9.50E-01	P	-4.54E+00	1.94E+00	8.43E+00
LB4110A - C2	Beta	11/18/2007	10/12/2015	1.02E+00	P	-4.04E-01	1.27E+00	2.13E+00
LB4110A - C3	Beta	11/18/2007	10/12/2015	1.67E+00	P	4.62E-01	1.56E+00	2.66E+00
LB4110A - C4	Beta	11/18/2007	10/12/2015	1.08E+00	P	-1.51E+00	1.91E+00	5.34E+00
LB4110A - D1	Beta	11/18/2007	10/12/2015	1.50E+00	P	-2.09E+00	2.40E+00	6.90E+00
LB4110A - D2	Beta	11/18/2007	10/12/2015	9.08E+00	F	-3.87E+00	2.41E+00	8.69E+00
LB4110A - D3	Beta	11/18/2007	10/12/2015	5.48E+00	F	2.04E-01	4.06E+00	7.92E+00
LB4110A - D4	Beta	11/18/2007	10/12/2015	5.98E+00	F	-7.55E+00	2.56E+00	1.27E+01
LB4110R - A1	Beta	11/24/2006	10/12/2015	1.48E+00	P	-5.32E+01	3.17E+00	5.96E+01
LB4110R - A2	Beta	11/24/2006	10/12/2015	1.17E+00	P	-4.20E+01	1.94E+00	4.59E+01
LB4110R - A3	Beta	11/24/2006	10/12/2015	7.00E-01	P	-3.90E+01	2.45E+00	4.39E+01
LB4110R - A4	Beta	11/24/2006	10/12/2015	1.28E+00	P	-3.87E+01	2.12E+00	4.29E+01
LB4110R - B1	Beta	11/24/2006	10/12/2015	1.68E+00	P	-4.09E+01	1.89E+00	4.46E+01
LB4110R - B2	Beta	11/24/2006	10/12/2015	9.67E-01	P	-5.97E+04	4.88E+02	6.07E+04
LB4110R - B3	Beta	11/24/2006	10/12/2015	1.28E+00	P	-4.08E+01	2.35E+00	4.55E+01
LB4110R - B4	Beta	11/24/2006	10/12/2015	1.05E+00	P	-4.10E+01	1.76E+00	4.45E+01
LB4110R - C1	Beta	11/24/2006	10/12/2015	1.20E+00	P	-4.09E+01	2.58E+00	4.61E+01
LB4110R - C2	Beta	11/24/2006	10/12/2015	1.65E+00	P	-4.08E+01	2.47E+00	4.57E+01
LB4110R - C3	Beta	11/24/2006	10/12/2015	1.38E+00	P	-4.12E+01	2.27E+00	4.58E+01
LB4110R - C4	Beta	11/24/2006	10/12/2015	1.52E+00	P	-4.66E+01	2.59E+00	5.18E+01
LB4110R - D1	Beta	11/24/2006	11/1/2014	0.00E+00	P	-4.36E+01	5.31E+00	5.43E+01
LB4110R - D2	Beta	11/24/2006	11/1/2014	0.00E+00	P	-4.67E+01	1.79E+00	5.03E+01
LB4110R - D3	Beta	11/24/2006	11/1/2014	0.00E+00	P	-5.02E+01	5.28E+00	6.07E+01
LB4110R - D4	Beta	11/24/2006	11/1/2014	0.00E+00	P	-4.64E+01	2.13E+00	5.07E+01
LB5100 - 1	Beta	7/10/2006	10/26/2007	4.52E+00	F	-3.19E-01	1.58E+00	3.48E+00

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Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	10/12/2015	0.2265	P	0.0230	0.2201	0.4173
LB4110A - A2	Alpha	11/18/2007	10/12/2015	0.2122	P	-0.0139	0.1812	0.3762
LB4110A - A3	Alpha	11/18/2007	10/12/2015	0.1967	P	-0.0347	0.1732	0.3811
LB4110A - A4	Alpha	11/18/2007	10/12/2015	0.2251	P	-0.0137	0.1940	0.4016
LB4110A - B1	Alpha	11/18/2007	10/12/2015	0.2004	W	0.1940	0.2226	0.2512
LB4110A - B2	Alpha	11/18/2007	10/12/2015	0.2020	P	0.1881	0.2179	0.2477
LB4110A - B3	Alpha	11/18/2007	10/12/2015	0.2265	P	0.1422	0.2324	0.3226
LB4110A - B4	Alpha	11/18/2007	10/12/2015	0.2233	P	0.2049	0.2333	0.2617
LB4110A - C1	Alpha	11/18/2007	10/12/2015	0.2098	P	0.1971	0.2192	0.2412
LB4110A - C2	Alpha	11/18/2007	10/12/2015	0.2191	P	0.1997	0.2246	0.2496
LB4110A - C3	Alpha	11/18/2007	10/12/2015	0.2466	P	0.2247	0.2485	0.2723
LB4110A - C4	Alpha	11/18/2007	10/12/2015	0.2161	P	0.1984	0.2243	0.2502
LB4110A - D1	Alpha	11/18/2007	10/12/2015	0.2178	P	0.1796	0.2287	0.2778
LB4110A - D2	Alpha	11/18/2007	10/12/2015	0.2354	P	0.2021	0.2542	0.3063
LB4110A - D3	Alpha	11/18/2007	10/12/2015	0.2514	P	0.2067	0.2599	0.3132
LB4110A - D4	Alpha	11/18/2007	10/12/2015	0.1890	P	0.1499	0.1962	0.2426
LB4110R - A1	Alpha	11/24/2006	10/12/2015	0.2340	P	0.1211	0.2378	0.3545
LB4110R - A2	Alpha	11/24/2006	10/12/2015	0.2061	P	0.1846	0.2177	0.2508
LB4110R - A3	Alpha	11/24/2006	10/12/2015	0.2023	P	0.1921	0.2225	0.2530
LB4110R - A4	Alpha	11/24/2006	10/12/2015	0.2330	P	0.2118	0.2436	0.2754
LB4110R - B1	Alpha	11/24/2006	10/12/2015	0.1914	P	0.1663	0.2205	0.2746
LB4110R - B2	Alpha	11/24/2006	10/12/2015	0.1984	P	0.1628	0.2123	0.2617
LB4110R - B3	Alpha	11/24/2006	10/12/2015	0.2237	P	0.1948	0.2419	0.2890
LB4110R - B4	Alpha	11/24/2006	10/12/2015	0.2161	P	0.1778	0.2266	0.2753
LB4110R - C1	Alpha	11/24/2006	10/12/2015	0.2001	P	0.1794	0.2129	0.2464
LB4110R - C2	Alpha	11/24/2006	10/12/2015	0.2063	P	0.1881	0.2214	0.2547
LB4110R - C3	Alpha	11/24/2006	10/12/2015	0.2263	P	0.2028	0.2369	0.2710
LB4110R - C4	Alpha	11/24/2006	10/12/2015	0.2017	P	0.1759	0.2178	0.2596
LB4110R - D1	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0281	0.1904	0.4089
LB4110R - D2	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0314	0.2165	0.4644
LB4110R - D3	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0308	0.2127	0.4562
LB4110R - D4	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0260	0.1714	0.3689
LB5100 - 1	Alpha	7/10/2006	10/26/2007	0.3368	P	0.3332	0.3455	0.3578

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Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	10/12/2015	0.5435	P	0.2606	0.5625	0.8644
LB4110A - A2	Beta	11/18/2007	10/12/2015	0.4750	P	0.2065	0.4674	0.7282
LB4110A - A3	Beta	11/18/2007	10/12/2015	0.4813	P	0.1479	0.4665	0.7852
LB4110A - A4	Beta	11/18/2007	10/12/2015	0.5401	P	0.1979	0.5080	0.8181
LB4110A - B1	Beta	11/18/2007	10/12/2015	0.5206	P	0.4671	0.5344	0.6017
LB4110A - B2	Beta	11/18/2007	10/12/2015	0.5022	P	0.4676	0.5266	0.5856
LB4110A - B3	Beta	11/18/2007	10/12/2015	0.5825	P	0.3484	0.5461	0.7437
LB4110A - B4	Beta	11/18/2007	10/12/2015	0.5555	P	0.4958	0.5564	0.6169
LB4110A - C1	Beta	11/18/2007	10/12/2015	0.5031	P	0.4387	0.5123	0.5858
LB4110A - C2	Beta	11/18/2007	10/12/2015	0.5282	P	0.4055	0.5189	0.6323
LB4110A - C3	Beta	11/18/2007	10/12/2015	0.6277	P	0.5280	0.6001	0.6722
LB4110A - C4	Beta	11/18/2007	10/12/2015	0.5619	P	0.4554	0.5359	0.6165
LB4110A - D1	Beta	11/18/2007	10/12/2015	0.6728	P	0.3812	0.5788	0.7764
LB4110A - D2	Beta	11/18/2007	10/12/2015	0.6433	P	0.4417	0.5988	0.7558
LB4110A - D3	Beta	11/18/2007	10/12/2015	0.6401	P	0.4851	0.6197	0.7543
LB4110A - D4	Beta	11/18/2007	10/12/2015	0.4889	P	0.3587	0.4727	0.5867
LB4110R - A1	Beta	11/24/2006	10/12/2015	0.5691	P	0.4864	0.5706	0.6548
LB4110R - A2	Beta	11/24/2006	10/12/2015	0.5124	P	0.4282	0.5126	0.5971
LB4110R - A3	Beta	11/24/2006	10/12/2015	0.5066	P	0.4579	0.5394	0.6209
LB4110R - A4	Beta	11/24/2006	10/12/2015	0.6025	P	0.5118	0.5958	0.6799
LB4110R - B1	Beta	11/24/2006	10/12/2015	0.4802	P	0.4267	0.5366	0.6465
LB4110R - B2	Beta	11/24/2006	10/12/2015	0.4980	P	-63.4810	0.0031	63.4873
LB4110R - B3	Beta	11/24/2006	10/12/2015	0.6012	P	0.4854	0.5959	0.7065
LB4110R - B4	Beta	11/24/2006	10/12/2015	0.5405	P	0.4453	0.5467	0.6481
LB4110R - C1	Beta	11/24/2006	10/12/2015	0.4782	P	0.4160	0.5002	0.5844
LB4110R - C2	Beta	11/24/2006	10/12/2015	0.5112	P	0.4365	0.5343	0.6320
LB4110R - C3	Beta	11/24/2006	10/12/2015	0.5408	P	0.4867	0.5744	0.6622
LB4110R - C4	Beta	11/24/2006	10/12/2015	0.5183	P	0.4353	0.5252	0.6151
LB4110R - D1	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0678	0.4553	0.9785
LB4110R - D2	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0756	0.5116	1.0989
LB4110R - D3	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0736	0.4969	1.0674
LB4110R - D4	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0630	0.4090	0.8811
LB5100 - 1	Beta	7/10/2006	10/26/2007	0.4428	F	0.4555	0.4731	0.4906

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